Request for Proposal Number DG133O-05-RP-1038

This cover letter is a summary of the salient elements of the procurement, but not an integral part of the enclosed Request for Proposal (RFP). In the event of a conflict between this RFP Cover Letter and the enclosed RFP, data and information in the RFP shall prevail.

You are invited to submit to the U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), a proposal in response to NOAA's Research and Development (R&D) High Performance Computer System (HPCS) requirements. The system life for the HPCS is projected to encompass eight years. The contract will be divided into a Base Contract Period of four years with an Option Contract Period of four years. The term of the base contract will be from date of contract award through September 30, 2006. The base contract will include three annual options, which if exercised, will extend the base contract period through September 30, 2009. Similarly, the contract option period will be for an initial one year period and include annual options for three additional years. The contract will also include a one-year extension to the base contract period and the option contract period. The one-year extension to the base contract period is included to permit the Government time to complete a competitive follow-on acquisition should the Government elect not to exercise the four-year option contract period. A similar one-year option will be included in the contract to extend the option contract period to permit transition to a follow-on contractor should it be necessary. The total period of the contract could be as long as nine years.

One of the objectives of this acquisition is to achieve maximum flexibility by establishing NOAA's R&D high performance computing system contract to be broad enough in scope and to have sufficient reserve capability (contract ceiling) to accommodate both existing and unanticipated requirements of NOAA and other partner agencies. To accomplish this objective, the contract will include two indefinite quantity options. The first indefinite quantity option provides a capability to acquire additional HPCS augmentations. These additional augmentations could be used to satisfy unanticipated NOAA requirements or requirements from a partnering agency, and will be established as fixed-price. The second indefinite quantity option will be to acquire additional engineering support (e.g., applications analyst, systems/network/security engineer, and facilities engineer) on a labor hour basis. This option may be exercised at any time during the contract life, and once exercised, will remain in effective for the balance of the contract life.

The Government anticipates leasing the equipment during the systems life (both Base Contract Period and Option Contract Period) with the exception of the Hierarchical Storage Management System which the Government will purchase during the first year of the Base Contract Period and the Option Contract Period, should the option be exercised.

Vendors are encouraged to visit the Government-furnished sites at the locations, dates and times specified in Section L.9 of the Solicitation. Vendors are required to submit its list of attendees for the site visits (by site) to me by January 21, 2005. Also, vendors interested in obtaining the facility drawings must prepare and submit all requisite forms by January 21, 2005 as prescribed in Section L.9.

Proposals are due no later than March 10, 2005, at 12:00 noon, Eastern Standard Time. The places designated for receipt of proposals are specified in Section L of the Solicitation. You are cautioned to carefully review Section L of this RFP concerning late proposals, modifications of proposals, or withdrawal of proposals. Please prepare your proposal strictly in accordance with the instructions set forth Section L of this RFP.

Proposals will be evaluated in accordance with Section M. Your proposal must have an acceptance period of not less than 120 days. Failure to comply with instructions could result in your proposal being considered unacceptable.

Although funds are not currently available for this requirement, it is anticipated that funds will be available at time of contract award. Therefore, this Solicitation is issued citing AVAILABILITY OF FUNDS (FAR 52.232-18) (APR 1984).

Sincerely,

William L. Voitk
Contracting Officer

SOLICITATION, OFFER AND AWARD

1. THIS CONTRACT IS A RATED ORDER UNDER DPAS (15 CFR 700)	RATING	PAGE 1 OF PAGES 1

2. CONTRACT NUMBER	3. SOLICITATION NUMBER	4. TYPE OF SOLICITATION	5. DATE ISSUED	6. REQUISITION/PURCHASE NUMBER
	DG1330-05-RP-1038	☐ SEALED BID (IFB) ☒ NEGOTIATED (RFP)	1/12/2005	NAAX1000-5-00002

7. ISSUED BY CODE

U.S. Department of Commerce/NOAA
1315 East West Highway, Room 9734
Silver Spring, MD 20910

8. ADDRESS OFFER TO *(If other than Item 7)*

NOTE: In sealed bid solicitations "offer" and "offeror" mean "bid" and "bidder".

SOLICITATION

9. Sealed offers in original and _____ copies for furnishing the supplies or services in the Schedule will be received at the place specified in Item 8, or if handcarried, in the depository located in See Section L.5 until 12:00 *(Hour)* local time 3/10/2005 *(Date)*

CAUTION - LATE Submissions, Modifications, and Withdrawals: See Section L, Provision No. 52.214-7 or 52.215-1. All offers are subject to all terms and conditions contained in this solicitation.

10. FOR INFORMATION CALL:	A. NAME	B. TELEPHONE *(NO COLLECT CALLS)* AREA CODE	NUMBER	EXT.	C. E-MAIL ADDRESS
	William L. Voitk	301	713-3525	196	william.voitk@noaa.gov

11. TABLE OF CONTENTS

(X)	SEC.	DESCRIPTION	PAGE(S)	(X)	SEC.	DESCRIPTION	PAGE(S)
		PART I - THE SCHEDULE				PART II - CONTRACT CLAUSES	
☒	A	SOLICITATION/CONTRACT FORM	1	☒	I	CONTRACT CLAUSES	5
☒	B	SUPPLIES OR SERVICES AND PRICES/COSTS	6			PART III - LIST OF DOCUMENTS, EXHIBITS AND OTHER ATTACH.	
☒	C	DESCRIPTION/SPECS./WORK STATEMENT	92	☒	J	LIST OF ATTACHMENTS	57
☒	D	PACKAGING AND MARKING	1			PART IV - REPRESENTATIONS AND INSTRUCTIONS	
☒	E	INSPECTION AND ACCEPTANCE	5	☒	K	REPRESENTATIONS, CERTIFICATIONS AND OTHER STATEMENTS OF OFFERORS	2
☒	F	DELIVERIES OR PERFORMANCE	3				
☒	G	CONTRACT ADMINISTRATION DATA	4	☒	L	INSTRS., CONDS., AND NOTICES TO OFFERORS	24
☒	H	SPECIAL CONTRACT REQUIREMENTS	21	☒	M	EVALUATION FACTORS FOR AWARD	10

OFFER *(Must be fully completed by offeror)*

NOTE: Item 12 does not apply if the solicitation includes the provisions at 52.214-16, Minimum Bid Acceptance Period.

12. In compliance with the above, the undersigned agrees, if this offer is accepted within 120 calendar days *(60 calendar days unless a different period is inserted by the offeror)* from the date for receipt of offers specified above, to furnish any or all items upon which prices are offered at the price set opposite each item, delivered at the designated point(s), within the time specified in the schedule.

13. DISCOUNT FOR PROMPT PAYMENT *(See Section I, Clause No. 52.232-8)*	10 CALENDAR DAYS (%)	20 CALENDAR DAYS (%)	30 CALENDAR DAYS (%)	CALENDAR DAYS (%)

14. ACKNOWLEDGMENT OF AMENDMENTS *(The offeror acknowledges receipt of amendments to the SOLICITATION for offerors and related documents numbered and dated)*:	AMENDMENT NO.	DATE	AMENDMENT NO.	DATE

15A. NAME AND ADDRESS OF OFFEROR — CODE _____ FACILITY _____

16. NAME AND TITLE OF PERSON AUTHORIZED TO SIGN OFFER *(Type or print)*

15B. TELEPHONE NUMBER AREA CODE	NUMBER	EXT.	☐ 15C. CHECK IF REMITTANCE ADDRESS IS DIFFERENT FROM ABOVE - ENTER SUCH ADDRESS IN SCHEDULE.	17. SIGNATURE	18. OFFER DATE

AWARD *(To be completed by Government)*

19. ACCEPTED AS TO ITEMS NUMBERED	20. AMOUNT	21. ACCOUNTING AND APPROPRIATION

22. AUTHORITY FOR USING OTHER THAN FULL AND OPEN COMPETITION:
☐ 10 U.S.C. 2304(c) ( ) ☐ 41 U.S.C. 253(c) ( )

23. SUBMIT INVOICES TO ADDRESS SHOWN IN *(4 copies unless otherwise specified)* ITEM

24. ADMINISTERED BY *(If other than Item 7)* CODE

25. PAYMENT WILL BE MADE BY CODE

26. NAME OF CONTRACTING OFFICER *(Type or print)*	27. UNITED STATES OF AMERICA *(Signature of Contracting Officer)*	28. AWARD DATE

IMPORTANT - Award will be made on this Form, or on Standard Form 26, or by other authorized official written notice.

PART I - THE SCHEDULE

SECTION B - SUPPLIES/SERVICES AND PRICE/COSTS

TABLE OF CONTENTS

B.1 SCOPE OF CONTRACT

The Contractor shall furnish, as required, the hardware, software, and support services in accordance with Section C, STATEMENT OF NEED, and in conformance with the terms and conditions of this contract. This is a firm-fixed price contract.

B.2 CONTRACT LINE ITEM DESCRIPTION LIST

CLIN	DESCRIPTION	QTY	UNIT	UNIT PRICE	TOTAL PRICE
(CLINs 0001, 0002, 0003, 0004, and 0005 inclusive are applicable to the Base Contract Period)					
	LOT I				
0001	System Delivery and Installation	01	LT		
0002	High Performance Computing System(s) in accordance with Section C, Statement of Need, for a period of one year from date of Acceptance	12	MO		
	LOT I, OPTION I				
0003	High Performance Computing System(s) in accordance with Section C, Statement of Need, for a period of one year from Expiration of CLIN 0002	12	MO		

LOT I, OPTION II

CLIN	DESCRIPTION	QTY	UNIT	UNIT PRICE	TOTAL PRICE
0004	High Performance Computing System(s) in accordance with Section C, Statement of Need, for a period of one year from Expiration of CLIN 0003	12	MO		

LOT I, OPTION III

0005	High Performance Computing System(s) in accordance with Section C, Statement of Need, for a period of one year from Expiration of CLIN 0004	12	MO		

LOT I, OPTION IV

0005A	Option to extend the High Performance Computing System(s) in accordance with Section C.9.2, Statement of Need, for a period of one year from expiration of CLIN 0005. This option may be exercised if LOT II, Option Contract Period is not exercised.	12	MO		

(CLINs 0006 through 0009 inclusive apply to the Option Contract Period. The Government may exercise this option for the option contract period at any time prior to the expiration of OPTION III, CLIN 0005.

LOT II, OPTION I

0006	High Performance Computing System(s) in accordance with Section C, Statement of Need, for a period of one year from Expiration of CLIN 0005	12	MO		

CLIN	DESCRIPTION	QTY	UNIT	UNIT PRICE	TOTAL PRICE
	LOT II, OPTION II				
0007	High Performance Computing System(s) in accordance with Section C, Statement of Need, for a period of one year from Expiration of CLIN 0006	12	MO		
	LOT II, OPTION III				
0008	High Performance Computing System(s) in accordance with Section C, Statement of Need, for a period of one year from Expiration of CLIN 0007	12	MO		
	LOT II, OPTION IV				
0009	High Performance Computing System(s) in accordance with Section C, Statement of Need, for a period of one year from Expiration of CLIN 0008	12	MO		
	LOT II, OPTION V				
0009A	Option to extend the High Performance Computing System(s) in accordance with Section C.9.3, Statement of Need, for a period of one year from expiration of CLIN 0005.	12	MO		

LOTS III and IV are Indefinite Quantity CLINs

LOT III

CLIN 0010 - Additional R&D HPCS Augmentation in accordance with Section C.9.4 of the Statement of Need. This option may be exercised at any time during the life of the contract (i.e., if this option is exercised during the base contract period, it shall remain in effect for the entire base contract period. This option may be exercised in whole or in part. Multiple delivery orders may be issued during the contract life. Should this option be exercised, the minimum amount of this option is $100,000 and the maximum amount is $200,000,000. Offerors are required to provide separate pricing for each individual workstream for each contract year.

CLIN	DESCRIPTION	UNIT PRICE
0010A	WS1 - Coupled Earth System Model	
0010B	WS2 - Coupled High Resolution Global Model	
0010C	WS3 - Very High Resolution Ocean Model	
0010D	WS4 - Environmental Modeling Test Bed	
0010E	WS5 – Climate Model Development and Calibration	
0010F	WS6 – Data Assimilation Development	
0010G	WS7 – Rapid Update Cycle	
0010H	WS8 – Weather Research and Forecast w/Atmospheric chemistry	
0010J	WS9 - Weather Research and Forecast w/static initialization	

LOT IV

CLIN 0011 – Optional engineering support services in accordance with Section C.9.5 of the Statement of Need. This option may be exercised at any time during the life of the contract. This option may be exercised in whole or in part. Multiple task orders may be issued during the contract life and task orders may be issued for a period of less than 12 months. Should this option be exercised, the minimum amount is $5,000 and the maximum amount is $5,000,000. Offerors are required to provide hourly rates by labor category for each contract year.

CLIN	DESCRIPTION	Hourly Rate
0011A	Applications Analyst	
0011B	Systems/Network/Security Engineer	
0011C	Facilities Engineer	

NOTES TO OFFERORS:

NOTE A - The amounts set forth below represent the maximum amount of funds that could be made available (Note: The annual figures cited have been reduced by the 6% Reserve Fund pool). Offerors are required to submit cost/price proposals for the most optimal computing systems based upon the following funding profile:

Base Contract Period		
FY 2006	-	$ 2.82 million
FY 2007	-	$21.43 million
FY 2008	-	$21.43 million
FY 2009	-	$21.43 million
Base Contract Total		$67.11 million

Option Contract Period		
FY 2010	-	$21.43 million
FY 2011	-	$21.43 million
FY 2012	-	$21.43 million
FY2013	-	$21.43 million
Option Contract Total		$85.72 million

One Year Option Period		
FY2014	-	$10.72 million

NOTE B - Offerors shall include with their price proposal, the interest rate used in calculating lease costs of equipment.

NOTE C – Submit Pricing Tables for various acquisition methods (e.g., LTOP, LWOP, Lease, etc.) proposed. Offerors are required to complete the Pricing Tables for only those methods of acquisition that are being proposed. For example, if an offeror is only proposing a lease method, the offeror is required to complete only a lease Pricing Table.

NOTE D - Offerors shall propose separate pricing for each year.

NOTE E - **The Government anticipates leasing the equipment during the systems life (both Base Contract Period and the Option Contract Period) with the exception of the Hierarchical Storage Management System which the Government will purchase during the first year of the Base Contract Period and the first year of the Option Contract Period, should the option be exercised .**

NOTE F - Section L contains the clause INVITATION TO PROPOSE FINANCING TERMS (FAR 52.232-31)(OCT 1995). For evaluation purposes, assume the following:

(1) Evaluation of financing proposals will be based upon October 1, 2005, as the first invoice payment and will continue for forty-eight (48) months. If monthly prices are adjusted because of system upgrade(s), offerors need to specify the month the adjustment occurs and the amount.

(2) In accordance with Federal Acquisition Regulation 32.205(c)(4) the time value of proposal specified contract financing arrangements shall be calculated using an interest rate of 4.4% as specified in Appendix C to Office of Management and Budget (OMB) Circular No. A-94, “Benefit-Cost Analysis of Federal Programs; Guidelines and Discounts.”

NOTE G - In preparing the cost proposal, Offerors should use October 1, 2005 as the start of the systems life.

Statement of Need (SON)

C.1 Procurement Objective

The objective of this procurement is to provide the computational and associated resources necessary to support continued advances in environmental modeling capabilities and other high-performance computing system requirements that may arise within NOAA and at other partner agencies. This procurement will be known as the NOAA Research and Development High Performance Computer System (R&D HPCS) acquisition.

This procurement embodies a new approach that NOAA adopted to holistically manage its HPCS as a corporate asset. Prior to this procurement, NOAA organizations requiring HPC procured them along organizational lines. NOAA determined that its HPCS will be established and managed based on functional requirements. NOAA established two functional requirements to meet its HPC needs: (1) Operations and (2) Applied Research and Development. This Statement of Need describes the functional requirements of NOAA's Applied Research and Development.

A primary goal of the new approach is to achieve economies of scale in conducting the R&D HPCS acquisition while providing maximum flexibility in the resulting contract document. NOAA intends to achieve economies of scale primarily through consolidation of requirements into fewer acquisitions. In order to achieve maximum flexibility, NOAA's intention for its R&D HPCS contract is to be broad enough in scope and to have sufficient reserve capability (contract ceiling) to accommodate both existing and unanticipated requirements.

The contract supporting this acquisition consists of a four-year base period, a four-year option period, and a one-year option to provide for contract transition (see Section C.9.1 for more information about the option periods). The Government expects that initial delivery, for Subsystems associated with workstreams 7-9, will occur in October 2005. The Government expects delivery, for any additional Subsystems or Components associated with workstreams 1-6, will occur in October 2006. A workstream (WS) is a single instance of end-to-end processing (including pre- and post-processing).

The Government requires a single Contractor to be responsible for the design, installation, maintenance, and support of the HPCS. The HPCS shall meet the stated objectives and specifications set forth in this SON and shall include all hardware and software necessary to operate as a complete, functional, balanced, and highly reliable system. The HPCS is comprised by Subsystems that are designed to help accomplish NOAA's R&D missions, as represented by workstreams. Some of the components that comprise a Subsystem include: Large-Scale Computing, Development Computing, Post-Processing and Analysis Computing, Data Management, Hierarchical Storage Management, Interconnects, Software, and Visualization. A single Contractor will serve as the point-of-contact for the entire HPCS, even though the HPCS may involve components from a number of different vendors, and potentially be located at multiple

sites. Fundamentally, the Government must improve all aspects of NOAA's computing environment in order to fulfill its R&D mission. These aspects include:

- High-performance computing, including large-scale computing, large-scale data post-processing, analysis, and visualization capabilities. As described in this document and Section J, the R&D workstreams are comprised of computationally intensive environmental modeling applications coupled to I/O-intensive codes and extensive data storage.
- Hierarchical Storage Management System (HSMS). The HSMS shall provide archiving capacity to meet the expected rates of data production on the HPCS.
- Software for resource management, system administration, and application development. The Government requires operating systems and cluster software that can manage resources. Complete and functional FORTRAN90, C, and C++ application development environments shall also be provided.
- Reliability, availability, and support. Availability of at least 96% (24 hours/day, 7 days/week, calculated each month) has been the historical goal for NOAA's R&D HPCS. The HPCS must continue NOAA's historically high utilization of its computing resources. System reliability, availability, and Contractor support are considered fundamental aspects of the HPCS.

Of the annual funding, 94% will be dedicated to the components and services for the HPCS. Under direction from the Government, the remaining 6% of the funds will be reserved to refine key areas of the HPCS or other aspects of the computing environment covered under the scope of the contract. Improvements will be made for performance, efficiency, or usability of the overall system. These areas may include, but will not be limited to, node, disk, memory, visualization, server, the network infrastructure, and additional support. The amount of the reserve funds may be unilaterally increased by the Government at any time during the course of the contract. The Government is not under obligation to direct the 6% reserve to the Contractor. Key areas will be identified on an as-needed basis by performance assessments, including an annual system performance review by the Government. The Government and the HPCS Contractor will work together to identify the necessary items that will best meet NOAA's computing needs. Actual purchases for this purpose will be solely at the Government's discretion.

The capabilities of the large-scale computers, hierarchical storage management system, analysis and visualization platforms, and network bandwidth shall be well-matched in a way that minimizes bottlenecks to the flow of information while maximizing performance. Achieving this proportionality in the acquired capabilities is an essential goal of this procurement. The Contractor is required to provide balanced performance.

The computing resources available to NOAA must meet its scientific needs throughout the life of the contract, so the Government requires a phased delivery of all components of the HPCS. The initial delivery of the HPCS must provide an increase over current capabilities in computational throughput for NOAA R&D. At least one significant upgrade to the sustained throughput must be provided during the base contract period,

with archiving and other HPCS capabilities increasing commensurately. Individual components of the HPCS need not be upgraded simultaneously.

The basic tenets and provisions of this SON establish what the Government feels are the minimum acceptable capabilities of the HPCS based on NOAA's experience in performing its mission. However, innovation in proposed high-performance solutions is encouraged. Newer technologies or an approach different from that presented here may provide opportunities to increase performance or enhance efficiency.

C.2 Background and Purpose

The mission of the National Oceanic and Atmospheric Administration (NOAA) is to understand and predict changes in the Earth's environment and to conserve and manage coastal and marine resources to meet our Nations' economic, social, and environmental needs. NOAA's mission is embodied in its four strategic goals:

- Protect, restore, and manage the use of coastal and ocean resources through ecosystem-based management.
- Understand climate variability and change to enhance society's ability to plan and respond.
- Serve society's needs for weather and water information.
- Support the Nation's commerce with information for safe, efficient, and environmentally sound transportation.

In support of NOAA's mission and goals, NOAA conducts research and gathers data about the global oceans, atmosphere, space, and sun, and applies this knowledge to science and services that touch the lives of all Americans.

The ability to "predict changes in the Earth's environment" depends primarily on a diverse set of environmental models, requiring considerable computational resources. These models are developed through research and development (R&D) efforts within NOAA that occur primarily at three organizations: Office of Oceanic and Atmospheric Research's (OAR) Forecast Systems Laboratory (FSL), located in Boulder, Colorado; National Weather Service's (NWS) National Centers for Environmental Predictions (NCEP), located in Camp Springs, Maryland; and OAR's Geophysical Fluid Dynamics Laboratory (GFDL), located in Princeton, New Jersey. Computational modeling continues to emerge throughout NOAA and is germane to the daily operation of many of its laboratories. Organizations such as the Pacific Marine Environmental Laboratory (PMEL), Climate Diagnostics Center (CDC), Aeronomy Laboratory (AL) and Air Resources Laboratory (ARL) use models for study of atmosphere, ocean, climate, air quality and ecosystem behavior.

C.3 Current NOAA R&D HPCS

The current HPCS is comprised of three Subsystems with components that include an IBM Power 4 cluster; a Linux cluster of Intel Xeon processors interconnected by Myrinet; and SGI Origin 3800, Origin 3900 and Altix systems. The entire HPCS

includes over 7.5 PB of storage capacity and greater then 15 million files. See Appendix A for a more complete description of the current HPCS.

C.4 Benchmarks

C.4.1 Workstream (WS) Profile

As previous mentioned, a workstream (WS) is a single instance of end-to-end processing (including pre- and post-processing). The set of instances of a given workstream within the Throughput Benchmark (see Section J) represents a set of jobs with similar characteristics within NOAA's current HPC infrastructure. NOAA's R&D HPCS Project Team defined 9 representative workstreams. See Section J for more complete descriptions of representative workstreams.

WS1	CM2-ESM	Coupled Earth System Model
WS2	CM2-HR	Coupled High Resolution Global Model
WS3	HIMF	Very High Resolution Ocean Model
WS4	EMTB	Environmental Modeling Test Bed
WS5	CMDC	Climate Model Development and Calibration
WS6	DAD	Data Assimilation Development
WS7	RUC	Rapid Update Cycle
WS8	WRF-CHEM	Weather Research and Forecast w/ atmospheric chemistry
WS9	WRF-SI	Weather Research and Forecast w/ static initialization

C.4.2 Benchmark Performance

Within a workstream's funding profile (see Section C.4.3), the Government requires the maximum System Life Throughput (SLT) utilizing a balanced solution for each workstream in the contract period. The Government considers every workstream to be of equal importance and expects performance increases for all of them.

The benchmark is comprised of a set of application workstreams. Each workstream is a sequence of steps designed to represent the complete end-to-end execution of a single modeling application used in NOAA R&D. Each workstream may contain multiple applications with a mix of compute-bound and I/O-bound codes. The Contractor shall minimize the execution time of each workstream and maximize the overall throughput when multiple workstreams are run concurrently, as described in Section J.

SLT is the metric of system performance for each workstream. The workstream SLT is a measure of system performance and availability integrated over time. See Section C.6.1.2 for more on workstream SLT.

The workstreams were baselined on three different computer systems. WS1 - WS3 were baselined on NOAA's Origin 3000 HPC in Princeton, NJ; WS4 - WS6 were baselined on NOAA's IBM Power 4 Regatta H HPC in Washington, D.C.; and WS7 - WS9 were baselined on NOAA's Xeon-based HPC cluster in Boulder, CO. Further details of these workstream baselines can be found in Section J.

The Government can most effectively use performance increases that are implemented at regular, but not too frequent intervals during the contract. Further, the Government would have difficulty using disproportionately high performance delivered either very early or late in the contract period. Accordingly, a given workstream should receive no more than two (2) performance upgrades during either the base or option periods.

The Government will evaluate performance increases in terms of the performance baseline described in Section J. The initial deliveries for WS7 - WS9 are required in Q1FY2006, the initial deliveries for WS1 - WS6 are required in Q1FY2007. The Government requires maximum System Life Throughput obtained by at least one significant mid-life upgrade during the base and option periods. It is desirable that the mid-contract upgrades for the base period for WS7 – WS9 occur between Q4FY2007 and Q1FY2008 while WS1 – WS6 upgrades should occur between Q2 and Q3FY2008.

Benchmarking for system upgrades shall be handled as follows:

- Benchmark revision is required at the *option period upgrade* (see Section C.9.1 for information on the option period upgrade).

- Benchmarks may change by mutual agreement between Government and Contractor at *mid-life upgrades*.
    - If a new benchmark is not defined, further changes to the benchmark software for performance will be allowed only at the discretion of the government.
    - Further, any software changes that are allowed will be used to create a new baseline with respect to the existing system.
    - Thus, a performance increment is always defined with respect to a constant set of source code across the change.

- Revised workstream benchmark codes and performance baseline must be delivered to the Contractor no later than 6 months prior to delivery of an upgrade.

- Throughput and scaling performance data shall be reported as described in Section J:
    - Throughput and Scaling values with class A changes only.
    - Any additional Throughput and Scaling values with class B, C and D changes. All such changes will be evaluated for risk as with the RFP response.

- The configuration management (CM) process will be utilized as the forum to discuss scientific advancement as it relates to model performance as well as software architecture changes to accommodate the new science. In the

context of the site-specific CM meetings, the framework will keep both Government and Contractor personnel up to date with desired future trends and aid the benchmark revision process. Among other items, the CM forum will be used by the Contractor to suggest benchmark code changes to NOAA technical staff for technical evaluation.

C.4.3 Funding Profile

Table I shows the projected funding levels associated with each workstream. These levels indicate current NOAA support for the programs represented by the workstreams. Offerors are expected to use this information in establishing performance goals for the benchmark. The offered configuration should provide flexibility to the Government to meet changing priorities throughout the contract period. The funding begins for workstreams 7-9 in FY2006. The funding for the remaining workstreams will begin in FY2007. The Government requires 6% of the funding to be reserved. Based on information provided by the Contractor, the Government will evaluate proposals in order to verify that workstream performance is appropriate to their funding profile.

The available funding level for the one-year extension options is anticipated to be approximately half of the normal yearly expenditures. More information about the extension options can be found in Sections C.9.2 and C.9.3.

Table I - Funding Profile in $Millions (shown before 6% reserve is removed)

		WS1	WS2	WS3	WS4	WS5	WS6	WS7	WS8	WS9	*Total*
Base	FY2006							$1.3	$1.0	$0.7	*$ 3.0*
	FY2007	$4.0	$6.0	$4.0	$1.933	$1.933	$1.934	$1.3	$1.0	$0.7	*$ 22.8*
	FY2008	$4.0	$6.0	$4.0	$1.933	$1.933	$1.934	$1.3	$1.0	$0.7	*$ 22.8*
	FY2009	$4.0	$6.0	$4.0	$1.933	$1.933	$1.934	$1.3	$1.0	$0.7	*$ 22.8*
Option	FY2010	$4.0	$6.0	$4.0	$1.933	$1.933	$1.934	$1.3	$1.0	$0.7	*$ 22.8*
	FY2011	$4.0	$6.0	$4.0	$1.933	$1.933	$1.934	$1.3	$1.0	$0.7	*$ 22.8*
	FY2012	$4.0	$6.0	$4.0	$1.933	$1.933	$1.934	$1.3	$1.0	$0.7	*$ 22.8*
	FY2013	$4.0	$6.0	$4.0	$1.933	$1.933	$1.934	$1.3	$1.0	$0.7	*$ 22.8*
Total		*$28.0*	*$42.0*	*$28.0*	*$13.531*	*$13.531*	*$13.538*	*$10.4*	*$ 8.0*	*$ 5.6*	*$162.6*

C.5 HPC Subsystem Components

C.5.1 Computing Requirements

C.5.1.1 Large-Scale Computing (LSC) Component

The Contractor shall provide a Large-Scale Computing (LSC) component at a substantial increase in sustained throughput over NOAA's current supercomputers described in Appendix A. Sustained throughput shall be measured by a throughput benchmark (see Section J) comprised of workstreams that are surrogates for NOAA's expected future workload. The metric of performance for the LSC is based on sustained throughput. The scalability of the computational platform(s) shall be measured by a benchmark designed to reveal the performance

and scaling characteristics of individual codes as they are executed on different processor counts. The scalability measure will assist the Government in evaluating performance projections.

It is required that whenever any set of resources (such as a cluster node) in the LSC fails, batch jobs using those resources must be capable of being rerun without user intervention. In this situation, only interactive sessions hosted on the failed resources will be lost, and the Subsystem must allow users to continue to be able to login interactively. It is desirable that failover be to processors that are binary-compatible with and running the same operating system level as the failed processors. The capability of the LSC to operate in degraded mode during repairs is required. It is desirable that the LSC have no single point of failure. The Government requires an availability level (defined in C.6.1.2) of at least 96% on every Subsystem in the R&D HPCS.

At least one substantial upgrade to the sustained throughput of the LSC, as measured by a throughput benchmark, shall be provided during the base contract period. This has traditionally been considered the mid-life upgrade.

C.5.1.2 Development Component

For each LSC Subsystem a binary compatible interactive development platform shall be provided. The development environment shall have the same software environment as the LSC Subsystem. The interactive resource should represent 5% to 15% of the LSC component. It is desirable that the amount of interactive resource available is adjustable within the Resource Management Software (see Section C.5.3.1) without a system reboot.

The Government requires resources for interactive work. The Government desires that interactive resources have a minimal impact on the batch production resources and vice-versa. It has been NOAA's experience that the nature of interactive R&D work creates resource contention with batch production jobs, and batch production jobs slow interactive response time. The Government desires the ability to reassign batch production resources for interactive work without a reboot or a restart to the batch system.

The Government desires early access to the Development Component for training, software porting and tuning, and OS and application configuration testing. Early access (with some Contractor provided engineering assistance) up to 6 to 9 months in advance of delivery is desirable.

C.5.1.3 Post-Processing and Analysis Component

Some of the HPC Subsystems described in Appendix A execute compute-bound and I/O-bound codes separately. For example, the climate computing resources, located in Princeton, use a Large Scale Cluster for the former and an Analysis Cluster, configured for very large sustained I/O, for the latter. The Contractor shall provide resources that can efficiently execute both types of codes, with the goal of

minimizing the execution time of each workstream and maximizing the overall throughput when the workstreams are run concurrently.

C.5.2 Data Management Requirements

The Government's scientific data are critical assets. As noted in section C.6, the Government requires the highest level of data integrity and at least 99% availability for access to its scientific data. The Government requires access to its scientific data in the absence of the Large-Scale Computing resources.

C.5.2.1 Home File System (HFS)

A Home File System (HFS) is required for each HPC Subsystem provided. This file system will have small quotas and be used to store source-code, small data sets, and environment initialization files. The Government desires initial HFS storage of several GBs per user with the ability to grow with each upgrade. The HFS shall be globally visible to the specific Subsystem with which it is associated. If the HFS is not available, no workload can be accomplished by the associated Subsystems. If no workload can be accomplished, the Subsystem will be in downtime, as described in Section C.6.1. The HFS shall be backed up utilizing an automated method (see Section C.5.2.8).

C.5.2.2 Fast-Scratch File System

A Fast-Scratch file system is high-bandwidth local storage that is visible by all processors within a given batch job. The Fast-Scratch file system will be purged frequently. The Fast-Scratch file system will not be backed up. Initially, per Subsystem, the Fast-Scratch file system shall be able to support 100 million files and individual files that are up to 500 GB in size. The Government expects that these requirements will grow over the life of the contract.

C.5.2.3 Long-term Scratch File System

Long-term disk storage is a staging area for users to temporarily place files that will continuously be manipulated. Large data sets that are not packed into a larger file are not conducive to a HSMS file system. This file system does not need to be backed up and can be purged of aged data. Initially, per Subsystem, the Long-term Scratch file system shall be able to support 100 million files and individual files that are up to 500 GB in size. The Government expects that these requirements will grow over the life of the contract.

It is anticipated that the scientific data for WS4 – WS9 will be primarily accessible through the Long-term Scratch File System. The Government requires accessibility to its scientific data in the absence of the Large-Scale Computing resources.

C.5.2.4 Hierarchical Storage Management System

The Hierarchical Storage Management System (HSMS) component will be purchased. The Government desires a flexible HSMS hardware configuration that can be changed or enhanced to optimize HSMS performance. Upgrades to the

HSMS shall be provided commensurate with upgrades to the computational resources, with overall system balance the goal. The HSMS shall meet the performance requirements of the HSMS Archive benchmark given in Section J.1.4.4.

The Government requires accessibility to its scientific data in the absence of the Large-Scale Computing resources. It is anticipated that the scientific data for WS1-WS3 will be primarily accessed through the HSMS.

The Government requires a two-tiered storage scheme for its data archive, comprised of frequently accessed nearline storage (robotically mounted at high speed) and infrequently accessed offline storage (also robotically mounted). This will effectively satisfy the requests for scientific data that make up NOAA's R&D workload (as discussed in section C.4). The HSMS software shall provide automatic migration between data archive tiers based on a combination of access time and file size. The Government desires that files recalled from the offline tier automatically revert to nearline tier residency. User-specified migration between tiers is also desirable. The Government desires a file display command, comparable to UNIX “ls –l”, which shows each file’s residency in the nearline or offline tier. The Government requires a daily report, submitted to the COTR, of storage used by groups and users in all storage tiers.

NOAA’s existing data archive for workstreams 1-3 resides on a Government owned, SGI/StorageTek HSMS in Princeton (see Appendix A). This legacy HSMS is available to the Contractor as unrestricted GFE beginning FY2007 (see Appendix C). The Contractor shall make arrangements to keep this data available, potentially at a reduced level of performance. The Government desires a transparent migration of this legacy archive to the new HSMS, maintaining the present filesystem image.

NOAA’s existing data archive for workstreams 4-6 resides on Government owned StorageTek Powderhorn silos located at IBM’s facility in Gaithersburg, MD (2 silos) and the government facility in Fairmont, West Virginia (1 silo) (see Appendix A). These silos presently support NOAA’s Operational Central Computer System (OCCS) and its backup. These legacy HSMS silos are available to the Contractor as unrestricted GFE beginning in FY2007 (see Appendix C). The Contractor shall make arrangements to keep this data available. The Government desires a transparent migration of this legacy archive data to the new HSMS, maintaining the present filesystem image. The HSMS proposed to support workstreams 4-6 is required to interface with either the OCCS or its backup which are located at Fairmont, W.V. and Gaithersburg, MD. (See C.5.2.5)

NOAA’s existing data archive for workstreams 7-9 resides on a Government owned, Sun/ADIC HSMS in Boulder (see Appendix A). This legacy HSMS will be under maintenance until 09/09/2006. At that point, the HSMS is available to the

Contractor as unrestricted GFE (see Appendix C). The Contractor shall make arrangements to keep this data available, potentially at a reduced level of performance. The Government desires a transparent migration of this legacy archive to the new HSMS, maintaining the present filesystem image.

Multiple archives may be provided. If disk is required for the caching or staging of files, it shall be fault-tolerant and shall be provided in addition to the other file systems.

If files are staged on disk, the Government desires enough disk space to keep files disk-resident at least 24 hours.

Each data archive shall be presented to the associated Subsystem as a single filesystem. Initially, per Subsystem, the HSMS shall be able to support 100 million files and individual files that are up to 500 GB in size. The Government desires HSMS software comparable to the San Diego Supercomputer Center (SDSC) Storage Resource Broker (SRB), which transparently combines logically related small files into one larger “container” file in the archive filesystem. More information on SRB is available at http://www.npaci.edu/DICE/SRB.

The Contractor shall provide all storage media used in the HSMS. The Government desires that files that haven’t been accessed in one year will be migrated from the nearline storage to the offline storage. The Contractor shall provide a media recovery service to recover data in the event of nearline or offline storage media failure, within 30 calendar days, as directed by the Government.

For the nearline tier, the Government desires a high file positioning rate, P, with matching robotic mount performance. For tape media, P (in files/hour) is given by the equation below. The “average search time” must apply to the method the HSMS software uses to position to files.

$$P = \frac{(n * 3600)}{(load + search + rewind + unload)}$$

P = file positioning rate
n = number of tape drives
$load$ = time to load a tape in sec.
$search$ = average search time in sec.
$rewind$ = average rewind time in sec.
$unload$ = time to unload a tape in sec.

For the nearline tier, the Government desires the use of several types of archive storage media optimized for the file size distribution, balancing file positioning time with file read time.

The Government desires that the HSMS software provide priority scheduling of data recall requests, assigning high priority to certain users or to batch jobs over interactive sessions.

C.5.2.5 Interfaces to the NOAA Operational Central Computer System (OCCS) and the Backup OCCS

The exchange of information to and from the NOAA Operations HPC is an integral part of NOAA's overall Research, Development and Operations processes; an objective of this procurement is to preserve the ability to execute such exchange of information.

The data that is generated from the OCCS, and available at both Fairmont, WV, and Gaithersburg, MD, is required to be written to the R&D HSMS that supports workstreams 4-9. This data consists of the run histories from the operational models along with observation data that are outputs from the OCCS. Table IIa shows the daily volumes that NOAA expects to be written over the life of the contract. Current practice is to "batch" these data and write them to the R&D HSMS during off peak hours to avoid contention with other HSMS users.

The OCCS backup system has a requirement to be able to both read from and write to the R&D HSMS that supports workstreams 4-6. The OCCS backup system will require similar HSMS access and latency characteristics as those that are described in Section J.1.4.4.3 for workstreams 4-6. This data is composed of model run histories and data generated from pre-operational model development work. Table IIa shows the daily volumes that NOAA expects to be written and read over the life of the contract.

C.5.2.6 Data Generation Profile

C.5.2.6.1 Data Generation for WS1 – WS3

NOAA's data generation for its computational baseline for WS1 – WS3 is shown below:

	WS1	WS2	WS3
Baseline Data Generation	1.4 TB/day	2.6 TB/day	1 TB/day

Data generation for WS1 – WS3 is related to the computational increases related to the workstream. Such changes shall be negotiated. Data generated (d) by the workstream (i) can be calculated using the following equation:

$$d_{i,j} = d_{i,(j-1)}\left(\frac{B_{i,(j-1)}}{B_{i,j}}\right)^{0.7}$$

d = Data generated by the workstream
B = workstream Benchmark time
i = Workstream number
j = system configuration period

Due to changes in the computational models, this equation may need to be changed throughout the life of the contract.

The following example demonstrates the application of the formula above. Assume that during the previous system configuration period (j-1), the workstream was generating 1 TB of data per day and the workstream Benchmark time ran in 10,800 seconds. Also assume that during the current system configuration period (j), the workstream Benchmark time now runs in 7,200 seconds. The data generation (d) for the current system configuration period (j) is given by:

$$d_{sample} = 1\frac{TB}{day}\left(\frac{10800\frac{s}{benchmark}}{7200\frac{s}{benchmark}}\right)^{0.7} = 1.34\frac{TB}{day}$$

C.5.2.6.2 Data Generation for WS4 – WS9

Table II shows the projected data generation associated with WS4 - WS9 throughout the contract period.

Table II -- Data Generation for WS4 – WS9 (in TB/day)

		WS4	WS5	WS6	WS7	WS8	WS9	*Totals*
Base	FY2006				2.4	2.2	1.6	*6.2*
	FY2007	2	3	2	2.4	2.2	1.6	*13.2*
	FY2008	4	3	4	4.8	4.4	3.2	*23.4*
	FY2009	5	3	5	4.8	4.4	3.2	*25.4*
Option	FY2010	8	6	8	9.5	8	6	*45.5*
	FY2011	10	6	10	9.5	8	6	*49.5*
	FY2012	17	6	17	12	10	8	*70*
	FY2013	24	12	24	12	10	8	*90*
Option FY2014		24	12	24	12	10	8	*90*

C.5.2.6.3 Data Generation for OCCS and the Backup OCCS

Table IIa shows the projected data generation for the OCCS and the Backup OCCS.

Table IIa -- Data Generation / Access Profile for OCCS and Backup

	OCCS (Write)	Backup (Read)	Backup (Write)
FY2007	2.2 TB/day	1.7 TB/day	1.8 TB/day
FY2008	3.2 TB/day	2.5 TB/day	2.7 TB/day

FY2009	4.6 TB/day	3.5 TB/day	3.9 TB/day
FY2010	6.6 TB/day	5.1 TB/day	5.5 TB/day
FY2011	9.4 TB/day	7.2 TB/day	7.9 TB/day

Note: The totals shown in the OCCS (Write) and Backup (Write) columns of this table are in addition to the totals shown in Table IIa (Data Generation for WS4-WS9).

C.5.2.7 Data Retention Profile

The data life-cycle is the expected number of years that the data from a workstream will be stored. These data are all of the remaining non-scratch files from a given workstream. This includes, but is not limited to, source code, input files, run time scripts, generated output, and analysis results.

Table III -- Data Retention Table

	Data Life-Cycle of the data for a given Workstream
WS1	100% for 9 years; 50% as a persistent archive.
WS2	100% for 9 years; 50% as a persistent archive.
WS3	100% for 9 years; 50% as a persistent archive.
WS4	100% for the first year; 50% for the second year; and 15% as a persistent archive.
WS5	100% for the first year; 50% for the second year; and 15% as a persistent archive.
WS6	100% for the first year; 50% for the second year; and 15% as a persistent archive.
WS7	100% for 3 DAYS; 20% for the first year; 10% for 3 years; and 5% for 8 years.
WS8	100% for 3 DAYS; 20% for the first year; 10% for 3 years; and 5% for 8 years.
WS9	100% for 3 DAYS; 20% for the first year; 10% for 3 years; and 5% for 8 years.

The data retention profile for the data shown in table IIa is 100% for the first year; 50% for the second year; 30% as a persistent archive. The funding for this storage is contained in the funding profile for workstreams 4, 5, and 6 shown in table I.

The following figure shows the accumulated data retention for WS4 – WS9. This is utilizing the data generation numbers shown in Table II of C.5.2.6 and Table III of this section. WS1 – WS3 cannot be shown without the computational growth being determined.

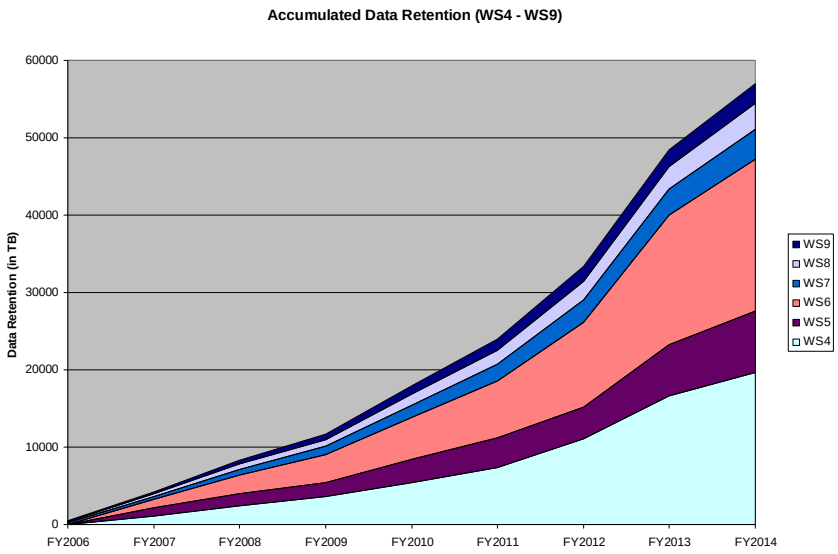

Figure 1 - Data Retention for WS4 - WS9

C.5.2.8 Automated backup

Automated backup shall be provided for all of the following: all unique system images on the HPCS; each Home File System (HFS); and the disk-resident inodes, metadata, and files on the HSMS. Software that allows users to restore /home files via a graphical interface is desirable.

For the HFS, a combination of full and incremental backups shall be done to robotically mounted tapes. These backups shall make it possible to restore files to their state on any day during the previous two calendar months. Minimal impact of these backups on the network load is desired.

A history of bimonthly (every 2 months) full backups, for the previous 12 months, shall be produced for shelf storage. A history of annual backups shall be produced until the end of the HPCS system life for shelf storage. At the Government's discretion, shelf storage may be at a remote location. It shall be possible to restore files from these backups until the end of the HPCS system life.

All hardware and storage media used for backup shall be provided by the Contractor.

C.5.3 Software Requirements

C.5.3.1 Resource Management Software

Efficient operation of the HPCS requires resource management that will facilitate use of the HPCS by NOAA's scientists as well as provide maximum throughput for their workload. The Government desires to implement a variety of algorithms for monthly processor time or enforce different resource allocations, including disk and tape quotas, for users, groups, or projects on each of the HPCS Subsystems. All

Resource Management Software shall be provided with documentation, training, and an established bug-fix process

The Government requires resource management software that provides:

1. Batch queuing and scheduling (see Section C.5.3.2)
2. Operating system based accounting software, comparable to Unix SVR4 process accounting.
3. System activity monitoring software on the LSC that shows user and system CPU utilization, I/O wait time, and paging activity.
4. Disk quotas on disk space and number of files, comparable to Unix 4.3 BSD quotas.

The Government desires resource management software on the LSC that provides:

- Software partitioning on the LSC

The Government desires the ability to test operating system and application software upgrades in isolation from the interactive and batch production resources on the HPCS.

C.5.3.2 Batch Queuing Software

The Government requires a Batch Queuing Software package to manage all HPC Subsystem computing resources. The Batch Queuing Software shall be provided with documentation, training, and an established bug-fix process.

To maintain flexibility, the Batch Queuing Software shall support execution hosts with heterogeneous processor architectures and operating systems.

The Batch Queuing Software shall perform the following functions:

- Spool batch job scripts when submitted.
- Tag each job with a user specified string that is at least 45 characters long.
- Run parallel-processed jobs on processors dedicated to the job.
- Create a unique scratch filesystem temporary directory for each job.
- Provide a way for large input files to be pre-staged to the scratch filesystem before the job acquires dedicated processors, and for large output files to be post-staged after the dedicated processors are released.
- Enforce limits on per-process cpu time, job-total cpu time, and elapsed (wallclock) time.
- Track and display job-total cpu time as the job runs.
- Do priority-based job scheduling, allowing higher priority to be assigned to specific jobs, or all jobs owned by a user or group.
- Limit the number of running jobs and monthly cpu hours used by users, groups, and projects or accounts.
- For accounting purposes, tag each job with a project or account string.

- Collect cluster-global job accounting information for each job, including:
  - the user,group, and project or account
  - the number of processors dedicated to the job
  - the job-total cpu time
  - the elapsed (wallclock) time
  - the date and time of job completion
  - NOAA specified programs identifier

The Batch Queuing Software shall provide text-based displays as specified below. It shall be possible to create custom text-based displays, at a minimum by post-processing the display output with text-processing tools such as awk or perl.

- Display all cluster hosts, showing for each host
  - the host up/down status
  - the host load and resource usage
- Display all running jobs, showing for each job
  - the host(s) the job is running on
  - the number of processors dedicated to the job
  - the job-total cpu time
  - the elapsed (wallclock) time
- Display all queued jobs, showing for each job
  - the number of processors requested by the job
  - the date and time the job was submitted
  - the per-process cpu time limit for the job
  - the elapsed (wallclock) time limit for the job
- Display all job accounting records for an operator specified time window

The following Batch Queuing Software features are desired:

- Uniform access to all HPCS computing resources, through use of a single Batch Queuing Software package.
- Meta-scheduling capabilities able to schedule batch jobs on multiple clusters over a wide-area network.
- Priority scheduling of large jobs, keeping smaller, lower priority jobs from starting. In addition, during this draining process, scheduling of small, short jobs, which will complete before the large job starts (backfill scheduling).
- Job scheduling based on consumable resources such as host memory, host disk space, or cluster-global shared disk space.
- Job suspend, job migration, and job checkpointing features that work for FORTRAN90, C, and C++ applications using the proposed parallel programming model.
- Interactive use integrated with the Batch Queuing Software, which provides the batch execution environment to interactive sessions. This will allow batch jobs scripts to be run interactively without change. Accounting of the cpu time used by interactive sessions.

The following Batch Queuing Software features are useful:

- Support for the user-level commands and command options of the POSIX 1003.2d Batch Environment standard (now part of POSIX 1003.1-2001).
- Client software which allows job submission and displays directly from the Government's Linux desktop workstations without interactive login to the HPCS.
- GUI-based displays.

Failover capability for job queuing and scheduling shall be provided.

C.5.3.3 Programming Environment Software

Required application development software for each LSC, development, post-processing and analysis Subsystem of the HPCS programming environment is comprised of:

1. FORTRAN 90/95, C, C++ programming environments, including:
    a. ANSI standard FORTRAN 90/95, C, and C++ compilers
    b. macro preprocessors
    c. source-level debuggers
    d. performance profilers
    e. support for 64-bit IEEE reals and integers
    f. support for reading and writing 32-and 64-bit IEEE floating-point formats in I/O operations
    g. MPI-1.1, MPI-2 I/O, MPI-2 one-sided communications (for Subsystems supporting parallel environments only)
    h. The make utility
2. Facilities for source code management, including rcs and cvs.
3. OpenMP is required to the extent that processing units share memory.
4. The Etnus TotalView parallel debugger.

Desired application software for the HPCS programming environments includes:

1. parallelized, optimized numerical libraries on the HPCS
2. optimized (possibly proprietary) I/O libraries.
3. data conversion facilities (for example, endian conversions and conversions of proprietary data formats used in the HPCS). Data conversion facilities will be required if the provided solution requires heterogeneous formats.

C.5.3.4 Commercial Off the Shelf Software

The Government requires sufficient software licenses, based upon the user profile, for the following Commercial Off the Shelf (COTS) software. The Government desires that site licenses are provided.

- Matlab (http://www.mathworks.com)
- Mathematica (http://www.mathematica.com)
- IDL (http://www.rsinc.com/idl/)
- S-Plus (http://www.insightful.com/products/splus/)

- System Performance Monitoring Tools to evaluate load balancing characteristics, system health, and other performance issues.

C.5.3.5 Community Supported Software

Required application software for the HPCS programming environments is comprised of:

- GRIB libraries and utilities (http://www.wmo.ch/web/www/WDM/Guides/Guide-binary-2.html)
- GNU make (http://www.gnu.org/software/make/make.html)
- GNU tar (http://www.gnu.org/software/tar/)
- Heirloom cpio (http://heirloom.sourceforge.net)
- libxml (http://xmlsoft.org)
- Environment Modules (http://modules.sourceforge.net/)
- netCDF and udunits libraries (http://www.unidata.ucar.edu)
- netCDF Operators (http://nco.sourceforge.net)
- Prior to the end of the Option Period, the Government expects that its modeling system software will become compliant with the Earth System Modeling Framework (ESMF). More information on ESMF is available at http://www.esmf.ucar.edu.
- tcsh (http://www.tcsh.org)

Required application software for interactive use is comprised of:

- Ferret (http://ferret.wrc.noaa.gov/Ferret/)
- GEMPAK/N-AWIPS (http://my.unidata.ucar.edu/content/software/gempak/)
- Ghostscript (http://www.cs.wisc.edu/~ghost/)
- Grace (http://plasma-gate.weizmann.ac.il/Grace/)
- GrADS (http://grads.iges.org/grads/grads.html)
- ImageMagick (http://www.imagemagick.org)
- NCAR graphics (http://ngwww.ucar.edu)
- Perl (http://www.perl.com)
- Python (http://www.python.org)
- Ruby (http://www.ruby-lang.org)
- VIS5D (http://vis5d.sourceforge.net)

C.5.4 Networking Requirements

C.5.4.1 User Profile

Table IV shows the percentage of HPC Resources allocated for the representative workstream (WSx) according to the locality of scientific users. Scientific users do not include Computer Operators, System Engineers, System Administrators, and administrative users.

Table IV - Users of Workstreams by Location (shown in %)

	WS1	WS2	WS3	WS4	WS5	WS6	WS7	WS8	WS9
Boulder				10%	5%	5%	65%	80%	80%
Washington				80%	80%	80%	10%	10%	
Princeton	96%	96%	96%	5%	10%				
Other	4%	4%	4%	5%	5%	15%	25%	10%	20%

User activities may be grouped into the following four categories:

1. Software and Model Development
2. Data Browsing
3. Model Production
4. Model Analysis

Software and model development includes activities such as code development, debugging and optimization as well as the scientific development of the models. The batch jobs submitted by this user set tend to be short, quick turnaround, but resource intensive (large PE counts, large data sets from archive or long term scratch, etc.) consistent with development of next generation models. Use of editors such as vi and XEMACS, the TotalView visual debugger and visualization tools such as GrADS and ncview characterize many of the interactive tools utilized by this user set. The interactive activities require good bandwidth as described below, and “LAN-like” moment to moment quality of service.

Data browsing is an activity ubiquitous to the user environment. Tools such as GrADS and ncview are employed to create a graphic representation of spatial and time domain data used as input to the models or created as part of model output. Those engaged in climate workstream activities such as WS1-3 and 5 tend to deal with large data files 1GB to 50GB while weather workstreams such as WS 4, 6 and 7-9 with files under 1GB. Such activities require good bandwidth as described below and “LAN-like” moment-to-moment quality of service. As a further distinction, climate data browsing is generally an “unstructured” activity (i.e. it’s not generally known in advance what data will be accessed) while weather data browsing can be viewed as “structured” (i.e. the desired datasets are known in advance).

Model production is characterized by data staging and model runs generally via the submission of batch scripts. This activity includes post processing such as that for WS1-3, 5 and 8 as well as production of graphics files such as that associated with WS7-9. These production runs can be relatively few, medium to long running, self re-submitting jobs such those characterized by WS1-6 or many short jobs such as WS7-9.

Model analysis is characterized by structured and unstructured data browsing and well as interactive and/or batch jobs to produce verification statistics.

File editing is a ubiquitous activity generally not requiring high bandwidth, but high moment-to-moment quality of service. Sufficient network bandwidth and quality of

service shall be supplied to meet all file editing, data browsing and interactive debugging requirements concurrently. The proposal should clearly indicate how the requirements for data browsing, interactive debugging and file editing at the required frame rates per second and quality of service will be met. Testing of the data browsing, interactive debugging and file editing requirements will proceed throughout the acceptance period with periodic monitoring throughout the contract.

C.5.4.1.1 User Profile for WS7 – WS9

NOAA has approximately 200 scientific user accounts associated with these workstreams. Approximately 75% of those users are located at the David Skaggs Research Center (DSRC), in Boulder, CO. The remaining 25% are scattered across the country. There are approximately 40 users engaged in software and model development, 80 users engaged in data browsing roughly 30% of their time, 15 users engaged in model production and 60 users engaged in model analysis. Data browsing tends to be of the unstructured type using NCAR graphics (NCL and user applications built with NCAR graphics library), Ncview, IDL (interactively and applications), GemPAK, Vis5D, and others. Some of these data-browsing activities involve viewing single frame images while others utilize loops of fields over time as well as interactive 3D manipulations. These visualization tools are X-window based applications producing 24bit RGB images. Typical resolutions range between 800x600 and 1280x1024. At the time of the initial delivery of resources supporting WS7-9, a minimum of 40 simultaneous data browsing sessions producing graphics files to be animated by GFE workstations on the LAN in Boulder, CO shall be supported. The files produced will be up to 150 frames and should be delivered to the user's GFE workstation in less than two minutes after the generation of the graphics files is completed. Additionally, a minimum of 6 simultaneous interactive TotalView debugger sessions shall be supported with LAN-like interactive use for the Boulder, CO user set.

C.5.4.1.2 User Profile for WS4 – WS6

NOAA has approximately 200 scientific user accounts associated with these workstreams. Approximately 80% of the users reside in the Washington DC metropolitan area. The remainder is spread across the country with some concentration at the NOAA labs in Princeton, Boulder and Miami. There are approximately 50 users engaged in software and model development, 70 users engaged in data browsing roughly 20% of their time, 10 users engaged in model production and 70 users engaged in model analysis. Data browsing tends to be of the structured type on files 1GB or less using GrADS. GrADS is an X-window based application producing 24bit RGB images with the number of pixels equal to the resolution of the model under study. The data from WS4 (WRF-NMM) produces images at a resolution of 501x233; WS5 (GFS) produces images at a resolution of 384X190; WS6 (GSI) produces images at a resolution 768X384. GSI provides an example of the requirement at the high end. The files produced will consist of up to 150

frames and should be delivered to the user's GFE workstation in less than two minutes after the generation of the graphics files is completed. At time of initial delivery of resources supporting WS4-6, a minimum of 30 simultaneous data browsing sessions shall be supported for the Washington, DC user set. Additionally, a minimum of 8 simultaneous interactive TotalView debugger sessions shall be supported with LAN-like interactive use for the Washington, DC user set.

C.5.4.1.3 User Profile for WS1 – WS3

NOAA has approximately 215 active (used in the last 90 days) scientific user accounts associated with these workstreams. Of the 96% of the Princeton users, approximately 35% are located on Princeton University's campus and are connected to NOAA's laboratory via high-bandwidth connectivity (see Section C.10.4.1). The remaining, approximately, 60% of the active accounts are users at NOAA's lab in Princeton. There are approximately 30 users engaged in software and model development, 80 users engaged in data browsing roughly 25% of their time, 12 users engaged in model production and 80 users engaged in model analysis. Data browsing tends to be of the unstructured type on files 1GB to 100GB using GrADS and ncview. Ncview is an X window based application producing 24bit RGB images with the number of pixels equal to the resolution of the model under study. The archive is currently mounted to each user workstation over the LAN. Thus, ncview may, run as a local application on the workstation, transferring the data from the file sitting on the archive staging disk. Some users currently prefer to copy the whole data file over the LAN to local storage on their workstation, again running ncview on the user workstation. Still others run ncview from a session logged onto the Analysis cluster (see Section C.10.2.3) directly in their /archive directory, thus sending a series of RGB frames over the LAN. The data from WS1 (CM2-ESM) produces images at resolutions of 144X90 (atmosphere and land) and 360X200 (ice and ocean); WS2 (CM2-HR) produces images at resolutions of 288X180 (atmosphere and land) and 1080X840 (ice and ocean); WS3 (HIMF) produces images at resolution 2160X680. HIMF provides an example of the requirement at the high end. At the benchmark resolution, a HIMF global field is approximately 1.47 million – 64-bit real values; the netCDF data file containing the field may be 10-100GB. A single image produced from this field by ncview is read, transferred and rendered in about 1.5 seconds producing an RGB image approximately 4.4MB in size. After initial rendering, an image rate of 15 frames per second implies an uncompressed data rate of 66MB/sec to the display. The Contractor is free to offer compression technology compatible with the user toolset which might reduce WAN/LAN requirements.

At time of initial delivery of resources supporting WS1-3, a minimum of 30 simultaneous data browsing sessions shall be supported for the Princeton, NJ user set. Note that within the time frame of initial delivery, the LAN supporting the Princeton, NJ user set is anticipated to be gigabit Ethernet. Additionally, a

minimum of 10 simultaneous interactive TotalView debugger sessions shall be supported with LAN-like interactive use for the Princeton, NJ user set. For information concerning the current SAN and LAN supporting these activities, see Sections C.10.3.2.3 and C.10.4.2.3, respectively.

C.5.4.2 Wide Area Network (WAN) Component

NOAA has existing WAN capabilities as described in Appendix A. The vendor is responsible for providing any additional connectivity required by the location of a provided Subsystem. For example this requirement may be driven by the data generation on the LSC as described in the Table II in Section C.5.2.6 or between the post processing and analysis component and the data and archiving component.

NOAA's Enterprise Network Target Architecture (ENTA) is currently being developed. The resulting NOAA-wide network infrastructure could be referred to as NOAAnet. Upon completion of this architecture, the Government may, at its option and at any time during this contract, require the Contractor to alter the WAN connection to comply with the NOAA ENTA. Such a change will be negotiated.

The Contractor is encouraged to be innovative in their Wide Area Network solution in order to optimize total system performance. The Government desires to balance the Wide Area Network solution that is provided with the impact it will have on the interactive experience of remotely located users.

C.5.4.3 High bandwidth connectivity to model and observation data

Near real-time observation and model data are required for use by given workstreams. The model data will be created and will be available from the NOAA Operational HPCS. The satellite data will be available from both the Operational HPCS and the NESDIS CEMSCS computer that is located in Suitland, MD. Table V shows the projected input data quantities required by each workstream. All model and observational data will originate from the NOAA operational data stream. Note that workstreams 4 and 6 require all of the data used by workstreams 7-9. More specifically, the data required for workstreams 7, 8 and 9 are a subset of that required for workstreams 4 and 6. Thus, if multiple workstreams can access the observation and model data sets from workstream 4, only a single transfer of the information would be necessary for those workstreams. There may be additional needs for real-time data acquisition from other sites, but they will be negotiated.

Table V- Data Ingest (TB/day)

	Required by WS7, WS8, and WS9	Required by WS4 and WS6 in addition to that required by WS7, WS8, and WS9
FY2006	1	
FY2007	2	1
FY2008	2	1
FY2009	4	2
FY2010	4	2
FY2011	8	4
FY2012	8	4
FY2013	12	12
FY2014	12	12

Approximately half of the data are model data. The other data is composed of operational and experimental satellite data, which are expected to be used in data assimilation systems. The expected data sources are the current satellites still in use at the beginning of the contract possibly including METEOSAT, GOES-10-12 and NOAA-14-18 (both imagers and sounders) as well as NASA's EOS-Aqua and EOS-Terra satellites (MODIS on both and AIRS/AMSU-A on Aqua), SSM/I (imager data) and SSM/IS (F16) on the DMSP satellites. New polar orbiting satellite data are expected to come from NOAA-N', NPP (sounder and imager in 2007), SSMIS on F17 (2005), F18 (2007), F19 (2008), F20 (2010), METOP (sounders and imager in 2005), NPOESS (sounders and imagers) C1 (2010), C2 (2011) and C3 (2013). For geostationary satellites, new sounder and imager satellite data will include GOES-N (2005), -O (2007), -P (2008) and – R (2012). All launch dates are approximate, and some need for transfer of simulated data streams of the same size as the actual data sets may occur up to a year prior to the launch dates.

Provision of the data to the NOAA R&D HPCS does not require the same timeliness as for operations. A delay of the data transfer of up to 6 hours is acceptable. At the discretion of the Government, further delays of the data can be counted as machine downtime. Also, it is required that no gaps in the data sets occur because of communications, and any delayed data should be communicated as soon as possible.

Currently available bandwidth should make the necessary data available within the Washington D.C. metro area and to the Skaggs building in Boulder. It should be noted that the data necessary for WS 4-6 is and will be available in the Washington D.C. metro area. It should also be noted that the data necessary for WX 7-9 is and will be available in the Skaggs building in Boulder. It is uncertain if the necessary bandwidth will be available to GFDL in Princeton. The Contractor is required to provide any necessary bandwidth, above and beyond the bandwidth provided by the Government, for the communication of this data.

C.5.4.4 Communications Requirement to Support the HSMS

The contractor shall be responsible for the communications link between the HSMS at either the Fairmont, WV or Gaithersburg, MD data access points, that is necessary to support Workstreams 4-5-6 and the Primary & Backup OCCS write and read functions described in table IIa. The interface specifications shall be negotiated with NCEP.

C.5.5 IT Security Requirements

To assure an adequate level of protection for in-house or commercially maintained IT systems, NOAA maintains all systems consistent with government-wide laws and regulations. The Office of Management and Budget (OMB) Circular A-130 requires all federal agencies to plan for the security of all IT systems throughout their life cycle. OMB Circular A-130 requires agencies to implement and maintain a program to assure that adequate security is provided for all agency information collected, processed, transmitted, stored, or disseminated in general support systems and major application. It further directs each agency to implement policies, standards, and procedures that are consistent with government-wide policies, standards, and procedures issued by the Office of Management and Budget (OMB) and Department of Commerce (DOC). OMB Circular A-130 also establishes a minimum set of controls to be included in Federal automated information security programs and assigns Federal agency responsibilities for the security of automated information.

At a minimum, agency programs shall include the following controls in their general support systems and major applications:

- Assignment of Responsibility for Security.
- System Security Plan consistent with guidance issued by the National Institute of Standards and Technology (NIST) to include:
    - Rules of Behavior/Application Rules.
    - Training.
    - Personnel Controls.
    - Incident Response Capability.
    - Continuity of Support/Contingency Planning.
    - Technical Security/Controls.
    - System Interconnection/Information Sharing.
    - Public Access Controls as required.
- Scheduled Review of Security Controls commensurate with the acceptable level of risk to the system.
- Authorize Processing (Certification and Accreditation).

The Federal Information Security Management Act of 2002 (FISMA), (HR 2548 E-Government Act, TITLE III – INFORMATION SECURITY, SEC. 301. INFORMATION SECURITY), addresses the program management and evaluation aspects of IT security.

Additionally, NOAA follows the US DOC Manual of Security Policies and Procedures, the US DOC IT Security Program Policy and Minimum Implementation Standards, as well as NOAA OCIO Policies and Directives.

More information can be found at:

- http://www.cio.noaa.gov (NOAA CIO web-site)
- https://www.csp.noaa.gov (NOAA IT Security Office web-site)
- http://www.osec.doc.gov/cio/oipr/ITSec/ITSECDOC1.HTM (DOC IT Security Program Office web-site)
- http://csrc.nist.gov/policies/ (NIST Federal Requirements)
- http://csrc.nist.gov/publications/nistpubs/index.html (NIST Guidelines)

In order to maintain a consistent security posture across potentially multiple sites, the Contractor shall be required to implement DOC/NOAA equivalent Patch Management, Change Management, and Perimeter Protection procedures for each processing site. These procedures shall be documented and maintained as part of the required NIST SP 800-37 Certification and Accreditation (C&A) package. Although the R&D HPCS will be managed as a single system regardless of physical location, it is expected that multiple sites must rely on public Internet infrastructure for inter-site communication. Special care must be taken to secure inter-site communication over an untrusted network, and mitigate the risks associated with the inherent trust relationships required for full R&D HPCS integration.

While the Government may provide some measure of physical or network perimeter protection for the system, the Contractor shall be wholly responsible for IT Security of the delivered solution. In instances where communication or interaction is required across system boundaries, standard (NIST SP 800-47) interconnection agreements will define the security responsibilities and procedures for all parties involved.

All solutions shall comply with all DOC and NOAA security policies. Industry best practices will be used to increase the security posture of the system beyond the DOC and NOAA policy requirements. NIST guidelines/practices are preferred industry best practices. For planning purposes, the R&D HPCS system will be designated as NOAA Mission Critical, with a FIPS 199 security categorization of {(confidentiality, low), (integrity, moderate), (availability, moderate)}. The resulting moderate-impact level designation may then be used to select recommended controls from NIST SP-53 (“Recommended Security Controls for Federal Information Systems”). However, the final system categorization will be determined through development and approval of the System Security Plan (SSP).

The following Commerce Acquisition Regulation (CAR) security clause is applicable to this contract:

Security Processing for Contractor/Subcontractor Personnel Working on a Department of Commerce Site (Low and Moderate Risk Contracts) (CAR 1352.237-72 (MAR 2000)

a. Security Processing Requirements

(1) U.S. Citizens Working on a DOC Site

All contractor (and subcontractor) personnel proposed to work on the premises of a Department of Commerce site for 180 days or more must undergo security processing by the Department's Office of Security (OSY) to be eligible to work on the site.

(2) Foreign Nationals (Non-U.S. Citizens)

Regardless of anticipated length of on-site work, all foreign nationals to be employed under this contract must:

(a) Have legal visa status with the Immigration and Naturalization Service (INS);
(b) Have advance approval from the serving Security Officer in consultation with the Office of Security.

b. Submittal Requirements – U.S. Citizens

(1) Duration of Onsite Work: 180 to 364 days (between 6 months and 1 year)

For individuals who will be performing work on a DOC site between 180 and 364 days, the Department will perform a Special Agreement Check (SAC). The scope of the SAC will include checks of the Security/Suitability Investigations Index (SII), other agency files (INVA), Defense Clearance Investigations Index (DCII), FBI Fingerprint (FBIF), and the FBI Information Management Division (FBIN).

The contractor must complete and submit the following form to the Contracting Officer's Technical Representative (COTR):

Form FD-258 (Fingerprint Chart)

Copies of this Form can be obtained from the COTR. Upon receipt of the FD-25, the COTR will complete form OFI 86C (Special Agreement Check) and will forward both to the operating unit Security Officer. The Security Officer will advise the COTR whether work can commence prior to suitability determination, based on the specifics of the situation. The COTR will notify the Contractor of an approved contract start date as well as favorable findings of the suitability determination.

(2) Duration of Onsite Work: 365 days (1 year) or more

Individuals proposed to perform work on a DOC site for 1 year (365 days) or more are required to have a NACI check (National Agency Check Plus Written Inquires).

The Contractor must complete and submit the following forms to the Contracting Officer's Technical Representative (COTR):

Standard Form 85P (SF-85P, Questionnaire for Public Trust Positions), and FD-258 (Fingerprint Chart).

Copies of these Forms can be obtained from the COTR. Upon receipt of the required forms, the COTR will forward the forms to the operating unit Security Officer. The Security Officer will advise the COTR whether work can commence prior to suitability determination, based on the specifics of the situation. The COTR will notify the Contractor of an approved contract start date as well as favorable findings of the suitability determination

c. Submittal Requirements – Foreign Nationals

All Foreign nationals proposed to work on a DOC site will be subject to a Special Agreement Check (SAC) to determine whether the foreign national has official legal status in the United States.

The Contractor must submit the following forms to the COTR for all foreign nationals proposed to work on a DOC site:

FD-258 (Fingerprint Chart)
Form OFI 86C (Special Agreement Check) with signature authorization for release of information

Copies of these Forms can be obtained from the COTR. Upon receipt of the required forms, the COTR will forward the forms to the operating unit Security Officer. The COTR will notify the Contractor of favorable findings and will notify the Contractor regarding an approved date to commence work under the contract.

d. Suitability Updates

Any individual (including foreign nationals) processed on the form OFI-86C (Special Agreement Check) who stays on the contract over 364 days will be required to have a NACI complete suitability check to stay on the job site.

e. Notification of Disqualifying Information

IF OSY receives disqualifying information on a contract employee, the Contractor, upon notification of such by the Contracting Officer, must immediately remove the employee from duties which require access to DOC facilities.

Individuals may be barred form working on the premises of a facility for any of the following:

(1) Conviction of a felony or a crime of violence or of a misdemeanor involving moral turpitude.
(2) Falsification of information entered in security screening forms or on other documents submitted to the Department.
(3) Improper conduct once performing on the contract, including criminal, infamous, dishonest, immoral, or notoriously disgraceful conduct or other conduct prejudicial to the Government regardless of whether the conduct directly related to the contract.
(4) Any behavior judged to pose a potential threat to departmental personnel or property.

Failure to comply with the requirements may result in termination of the contract. Compliance with these requirements shall not be construed as providing a contract employee clearance to have access to classified information.

C.5.6 Facilities Requirements

The Contractor shall provide a facilities proposal for housing the proposed equipment to meet the Government's requirements over the life of the contract. Contractors may use any of the following to meet the Government's needs: any of the available Government facilities (as described in Section C.11), either as is or with modifications; Contractor-provided facilities; or a combination of Government facilities and Contractor facilities. The Contractor shall provide details of their proposed facilities solution in the Facilities Proposal that they include in their submission.

C.5.6.1 Government-Provided Facilities

Contractors may use the projected facilities offered at the NOAA locations in Boulder, CO, Princeton, NJ, Fairmont, WV, and Largo, MD, which are described in Section C.11. Section C.11.11 indicates the government-supported resources that are projected to be available, beginning at the times indicated and provided under the assumptions indicated in that section. If Contractors require additional facility resources at these locations beyond what is indicated, they must provide a modification plan in their proposal that indicates proposed changes, with schedules, for the work to be done. The modification plan must be in accordance with site restrictions.

Contractor use of the government-supported resources implies the following:

The Government is responsible for delivering the indicated facilities resources (although the Contractor will be responsible for paying power utility costs at the Princeton facility in accordance with Section H.). Because of this, any lost system time caused by environmental outages or facility failures will be recorded as null time for availability calculations.

- The Contractor is responsible for the funding of any facility modifications (e.g., new electrical equipment, plumbing, additional air conditioning equipment) needed to install and support the proposed systems. In the case of the Princeton, NJ facility, the Contractor will also be responsible for carrying out the facility modifications; at the other four facilities, the landlord will be responsible for carrying out the modifications. A description of these modifications, including schedules, must be included as part of the Contractor's Facilities Proposal. Any new facilities equipment (e.g., air conditioning or electrical equipment) or building modifications will become the property of the Government or Princeton University at the Princeton facility or West Virginia Research Corporation at the Fairmont, WV facility, each of whom will be responsible for their maintenance.

For any facility modifications to be made, the Contractor must follow the following procedures that are specific to each of the indicated sites:

Boulder, CO
The David Skaggs Research Center (DSRC) is owned by the Government and operated by the General Services Administration (GSA). Because of this, all building modifications are subject to GSA Regulations, thereby requiring that GSA contractors carry out these modifications. Therefore, any facilities modifications will require that funds be held back from the contract for transfer to GSA for any changes to be made to GSA properties.

Close coordination with the DSRC landlord, U.S. General Services Administration (GSA), will be required if any building modifications are required. Costs will include normal GSA overhead charges plus project management oversight. All modifications must meet standard building codes as dictated by GSA. Modifications can include small projects like power receptacle changes, to large projects like chiller plant upgrades. Normal government contracting procedures can be expected for any modifications.

Because of this, Contractors shall include an estimate of the cost of any facility modifications within their Cost Proposal for the fiscal year indicated for the work to be done. The funds available to the Contractor will be reduced by the final cost for the facility modifications performed by GSA Contractors.

Princeton, NJ
Because the Princeton buildings are owned by Princeton University, all construction is subject to all applicable building codes and approvals for the work from Plainsboro

Township and Princeton University. In addition, if these facility modifications cause any changes to the exterior of the building, these modifications shall be in accordance with Princeton University's Princeton Forrestal Center Design and Development Criteria, which includes approval by the Design Review Committee.

Fairmont, WV
The NASA Independent Verification and Validation (IV&V) Facility is owned and operated by the West Virginia University Research Corporation (WVURC) but provided by WVURC to NASA to house NASA's IV&V Facility. All construction is subject to all applicable building codes and approvals for the work by WVURC and NASA. Any proposed modifications or upgrades will be approved by and installed by West Virginia University Research Corporation.

Largo, MD
The Largo facility is a commercial facility that is leased through GSA. Modifications to the Largo facility are routed through the NOAA Facilities office, which contacts GSA and handles lease modifications. GSA contacts the building owner, Michael Management Inc., which in turn brings in contractors and handles any required permits. Modifications to date have had turnaround times of 2 to 6 months for completion (10 months for the generator, due to manufacturer delays), dependent upon scope. GSA personnel have consistently monitored ongoing work and pushed to meet the Government's time constraints.

C.5.6.2 Contractor-Provided Facilities

The Contractor may propose to use facilities other than the Government-provided facilities that are described in Section C.11. Any Contractor-provided facilities shall meet the following conditions:

- Contractors are responsible for providing all facilities resources, including floor space, utilities, facilities maintenance, janitorial services, etc. Therefore, any lost system time caused by environmental outages (such as loss of power, cooling, etc.) or facility failures will be recorded as downtime for availability calculations.
- Contractors may use any Unrestricted GFE provided in Appendix C, Section C.12, but are responsible for all shipping costs, both to the Contractor site and back, as directed by the Government.
- Designated Government personnel must have access to the Contractor facility on an as-needed basis, subject to reasonable controls.

C.5.6.3 Office space, workstations, LAN connectivity, phone service, and office equipment for on-site contract personnel

The following policies will be in force for any Contract personnel to be located at Government sites.

The Government will provide LAN connectivity to all Contractor personnel located at its sites. The Contractor shall provide workstations, phone service, and office furniture for all of its personnel located at Government sites, although the Government may, for its convenience, choose to provide this on a case-by-case basis. To assure that IT security policies are maintained, the Government will require Contractors to install, operate, and maintain their workstations on the LAN in a manner that is consistent with Government IT security policies.

Boulder, CO

The Government will supply two (2) 150-sq. ft. offices and approximately 100 square feet of lab space for use by the Contractor.

Washington, DC

NCEP can accommodate two on-site personnel at the World Weather Building and its annexes. However Office space is extremely limited, so contractors should limit office space requirements as much as possible.

Princeton, NJ

The Government will provide five offices plus one storage room. Four of the offices and the storage room are currently being designed and will be constructed on the south hard pan of the Computer Room. They will occupy a total of about 570 sq. ft. over an area of 12' x 48' approximately. This space is intended for use by the Contractor's personnel who are responsible for system operation. The other office is located just across the hall from the Computer Room. The Government will attempt to provide additional office space to other Contractor personnel on an as-needed and as-available basis.

Fairmont, WV

The Government will provide approximately 500 sq. ft. of office space to be configured as directed by NOAA or NOAA's contractor.

C.6 Reliability and Availability Requirements

C.6.1 Reliability and Availability

The HPCS shall continue NOAA's historically high utilization of its computing resources. Reliability, availability, and Contractor support are considered fundamental aspects of the HPCS.

C.6.1.1 Reliability

Downtime (as defined in Section C.13, Appendix D) will be used in the determination of the actual System Life Throughput. Periods of Remedial and Preventive Maintenance count as downtime. Null time will not be counted as downtime. Null time is that period of time when the workload cannot be accomplished due to environmental failure at a Government furnished site, such as loss of electric power or cooling, or recovery from environmental failure. Downtime for each HPCS component is based on the fraction of the resources available for that component's workload. It is arrived at through consultation between the Government and the Contractor, and ultimately determined by the Government.

Downtime is accumulated on the HPCS if the Government is not able to execute its workload when access to the scientific data via the storage or archiving components is unavailable.

A component's downtime shall commence at the time the Government makes a bona fide attempt to contact the Contractor at the designated point of contact (see Section C.7.1). At this time, the Government will begin a log of the problem which will be completed and signed by both the Government and the Contractor when the problem is resolved. Information to be entered into the log will be determined by the Government.

A component's downtime shall exclude any time in which the Government denies the Contractor maintenance personnel access to the malfunctioning hardware and/or software. (Routine procedures for entry to a facility shall not be construed as denial of access.)

A component's downtime shall end when it is returned to the Government in operable condition as determined by the Government, ready to perform all of the workload.

Preventive Maintenance (PM) is to be completed at times determined by the Government.

The testing and installation of every major operating system release installed at the request of the Government and one (1) minor operating system release installed at the request of the Government during any annual period will count as downtime. Preparation for and execution of post-upgrade LTDs, including any benchmark development by the Contractor, associated with the agreed-upon upgrades proposed at contract award, will count as downtime.

The Government, at its discretion, may provide a series of carefully monitored workstreams that may include up to twenty-five (25) individual batch jobs in order to verify the reliability of the system. These workstreams will be monitored for end-to-end success. Complete or partial failure of any intermediate step will result in declaring the workstream to have failed. Success will be determined as the number of successful workstreams divided by the number of attempted workstreams in a 30 day period per Subsystem. The Government requires that ratio must be greater than or equal to the proposed availability. This will be evaluated monthly. Failures due to null time, application errors, or data errors will not be included in either the numerator or denominator of the above ratio.

C.6.1.2 Availability

All components of the HPCS must perform as an integrated system to provide the Government with at least 96% availability. These components include not only those typically associated with a high performance computing system but also any WAN component provided as part of the HPCS. Additionally, the Government

requires 99% availability for access to its scientific data. Scientific data archives may be on the Long-Term Scratch component or the HSMS component, depending on the overall architecture associated with a given workstream. The Government's data are critical assets associated with the HPCS. With the large amount of data associated with the HPCS, the Government requires the highest levels of data integrity.

Although availability will be monitored daily, it will be measured on a monthly basis. The Contractor shall establish and maintain accurate system monitoring and/or logs to support system availability measurements. Monitoring tools must be made available to the Government. Throughput shall be determined by relating system availability to the workstreams targeted to run on that system. For example, if Subsystem A typically runs workstreams 1 – 2, workstreams 3 – 9 will not be used to determine the amount of "lost" throughput, if any.

Availability shall be determined by computing the ratio of total computation processor hours available for execution of R&D jobs to the total computation processor hours each month, excluding Null Time. The time a computation processor is available for execution is determined by subtracting processor downtime from wall clock time. Spare processors can be included in the computation pool to reduce downtime. However, downtime accumulates until the spare processors are made available for job execution. Accumulated computational cycles (in CPU-hours) that are lost when jobs are lost due to component failure or component reboot will not count toward the system-life throughput calculation. If the accounting software cannot report the accumulated computational cycles for each active job at the time of failure, it will be assumed that four (4) CPU-hours were lost for all processor(s) on the failed system.

System Life Throughput (SLT), for a given workstream i, can be calculated by the following equation:

$$SLT_i = \sum_j \frac{T_{i,j} A_{i,j}}{B_{i,j}}$$

SLT = System Life Throughput
T = total wall-clock Time during system configuration j
A = proposed Availability
B = workstream Benchmark time
i = WS number
j = system configuration period

An example of System Life Throughput for a sample workstream can be demonstrated for FY2001-FY2003. This calculation is based on actual calendar days beginning October 1, 2000. For example, if the proposed LSC throughput benchmark execution time is 10,800 seconds initially, and is upgraded to 7,200 seconds on October 1, 2001, and a 98% availability is proposed through the three-year period, the system life throughput SLT is given below (Note: there are 86,400 seconds in a day).

$$SLT_{sample} = \frac{((365\frac{days}{year})(86400\frac{s}{day}))(0.98)}{10{,}800\frac{s}{throughput\_benchmark}} + \frac{(2(365\frac{days}{year})(86400\frac{s}{day}))(0.98)}{7200\frac{s}{throughput\_benchmark}}$$

$$SLT_{sample} = 11446.4 throughput\_benchmark$$

Proposed throughput benchmark performance levels will be combined with the proposed availability level (98% is shown in the example above) to determine a measure of overall proposed System Life Throughput for the workstream. The actual throughput will be measured on a daily basis by monitoring the availability of the components associated with the given workstream. All performance levels must be met for each measurement of actual throughput regardless of past delivery of suites.

Although system throughput shall be monitored daily, the accumulated System Life Throughput of the workstream shall be calculated monthly. At the sole discretion of the Government, shortfalls in throughput shall be made up with either the delivery of additional equipment installed at no cost to the Government, or accrual of downtime credit. Should the Government elect the delivery of additional equipment to satisfy throughput shortfalls, the Government will calculate the duration of the compensation using the demonstrated benchmark performance on the upgraded HPC Subsystem. It is the Government's goal to meet the total System Life Throughput by the end of the contract in a manner that does not require frequent disruptions, front-loading of cycles, or back-loading of cycles. Should the Government elect downtime credits in lieu of additional equipment, downtime credits will be deducted from the most recent invoice. Downtime credits shall accrue on all components of the system(s).

At the sole discretion of the Government, shortfalls in proposed availability or performance of non-computational components shall be rectified with the delivery of additional equipment or engineering, at no cost to the Government, or accrual of downtime credit. To better reflect NOAA's computational needs over time, changes in the HPCS workstream benchmarks shall be made by mutual agreement between the Government and the Contractor through the life of the HPCS.

The Government requires a credible method of maintaining system availability. The Government expects that fail-over and high reliability components will be used. The Government requires sufficient power during environmental failure to gracefully shut down all components of the HPCS. Further, the Government requires adequate power conditioning to insulate the System from power spikes and sags. It is expected that uninterruptible power supplies (UPSs) and power distribution units (PDUs) will be needed for all components of the HPCS to meet these requirements.

C.7 Support Services Requirements

C.7.1 Support

The Contractor shall provide the Government with a designated point of contact to request maintenance. The Contractor shall maintain escalation procedures that allow the Government round-the-clock telephone contact with knowledgeable Contractor staff should the designated point of contact be unavailable.

For each provided HPC Subsystem, the Government requires comprehensive support in order to meet the 96% availability requirement. Support professionals can consist of systems analysts, hardware engineers, and applications analysts. Contractor system analysts shall work closely with Government system administrators. Government system administrators shall have root access to the HPCS computing platforms. The Government requires a senior applications analyst to be located at the primary user sites for WS1 – WS9. Senior Application Analysts shall be available, in person, during business hours. The primary user sites are described in the User Profile Section, C.5.4.1. NOAA expects to provide offices for the senior analysts at its facilities (see Section C.5.6.3 for more information). It is anticipated that additional senior application analysts may be required during transitions to new technologies (see Section C.9.5).

The Government requires the Contractor to maintain a current, itemized list of all Contractor-supplied hardware and software items in printable electronic form. The listing must be updated whenever a system upgrade or engineering change proposal results in a change to the system configuration or delivery of additional equipment. The listing is to be submitted to the COTR upon request.

C.7.2 Training

Training shall be provided for NOAA computer specialists and operators in:

- system administration and tuning
- hardware operation and system overview

Training shall be provided for a large number of NOAA applications programmers in:

- application and shell programming
- programming languages and tools
- HSMS software user interface
- optimization

The Contractor shall provide the Government with a list of additional potential training topics. Training must be collocated with users to the greatest extent possible. On-line training with access to experts will be considered.

The Government desires to begin training when early access to systems similar to those proposed for the HPCS is granted. See Section C.5.1.2 for more information.

C.8 Project Plan Requirements

C.8.1 Project Management

The contractor shall be responsible for all functions related to managing the NOAA HPCS R&D system as a single project. NOAA will retain responsibility for project oversight and directing project activities (such as resource allocation) that directly impact the Government. The contractor shall establish communication avenues to keep NOAA managers apprised of daily status and alerts. A formal project management review process shall also be established as well as described below.

Reference materials for standard Government Information Technology project management are available on the Internet, for example: http://cio.doe.gov/ITReform/sqse/publications.htm#Checklists

The contractor shall appoint a Project Manager and assistants as required. This management team will be responsible for meeting NOAA's technical and business requirements (including security), project planning (cost, schedule quality), resource mapping, identifying dependencies and support issues and managing subcontractors. The Project Manager shall hold an Annual Meeting for NOAA management in Silver Spring, MD to discuss project status and plans for the coming year.

C.8.2 Transition to "One NOAA"

Transition to "One NOAA" requires increased integration of NOAA HPC resources over time to provide additional flexibility and robustness. Elements of the long-term vision include:

1) the ability of users to access any computational platform in order to:
    a. achieve code interoperability with good performance
    b. provide continuity of operations
    c. respond to changing programmatic requirements
    d. Provide similar programming environment and tools across platforms to minimize user re-training.
2) the ability of users to access data from any platform of the HPCS and to migrate data from any existing archive to future archives
3) an ongoing collaboration with the Contractor to produce additional business processes that promote integration

Features of the NOAA R&D HPCS that promote this vision may include a single security profile, including single sign-on, and a single user interface into all HPC resources, which may include a single batch scheduler or a metascheduler. NOAA recognizes that not all elements of the vision may be available on the system provided during the term of the base contract, or may compromise performance unacceptably. In this case, NOAA may choose to forego implementation of one or more of the elements of this vision.

NOAA considers the risk of transition to the full suite of these capabilities at day one of the contract to be very high due to both the immaturity of the underlying technology for distributed operations and the significant business process changes required of users and institutions.

C.8.3 Documentation

The Contractor shall provide adequate documentation for maintenance of all Project Management and the Configuration Management system. This includes, but is not limited to, baseline configuration, implementation methodology, a formal project plan, and documentation of administrative tasks.

C.8.4 Configuration and Change Management Plan

The Contractor shall establish a Configuration Management (CM) process including a Configuration Management Control Board to include both contractor and NOAA Government staff. The Government desires that the Control Board and Configuration Management process integrate into existing Government Control Boards and processes where applicable. Configuration Management plans (at the minimum for network, hardware and software (see Section C.4.2)) shall be developed by the contractor and presented to the CM Board for approval. Not less than monthly CM meetings shall be held to review system status and plans for the future. The contractor shall be responsible for preparing an Annual Configuration Management Plan for presentation to NOAA management in Silver Spring, MD. The Configuration Management Control Board will be responsible for oversight of benchmark workstreams, modifications to the benchmarks and for scheduling system time in support of benchmarking.

C.8.5 Transition Requirements

C.8.5.1 The Contractor shall develop and submit within 60 days of a written request by the Government a comprehensive Transition Baseline Report. The goal of the Transition Baseline Report is to avoid disruption of the day-to-day conduct of HPC computing while achieving a smooth and orderly transfer of responsibility from the Contractor to a successor contractor. It should compile available information related to current system configuration, performance, support requirements, issues, risks, and other information deemed pertinent by the government.

C.8.5.2 Thirty (30) calendar days prior to the completion of this contract, an observation period shall occur, during which time personnel of the successor contractor may observe operations and performance methods of the outgoing Contractor. This will allow for orderly turnover of facilities, equipment, and records and will help to ensure continuity of service. The outgoing Contractor shall not defer any requirements for the purpose of avoiding responsibility or of transferring such responsibility to the succeeding contractor. The outgoing Contractor shall fully cooperate with the succeeding contractor and the Government so as not to interfere with a smooth transition and ongoing accomplishment of the government's work.

C.8.5.3 Thirty (30) calendar days prior to a scheduled midlife system upgrade the contractor shall submit a written plan to the Government describing how the upgrade will be implemented. It should contain a schedule, information related to configuration, performance, support requirements, issues, risks, and other information deemed pertinent by the government.

C.9 Contract Options

C.9.1 Option Period

The Base Period of the contract is FY2006-FY2009. The Government requires an option to extend the contract for another four years from FY2010-FY2013. Requirements are listed in Section C.

C.9.2 One-year extension of Base Period

After the four-year Base Period, for FY2010, the Government requires the option to extend the lease for operations, maintenance and the equipment for one additional year in quarterly increments. The Government estimates that the annual funding for this extension to be half of the FY2009 funding level (see Section C.4.3).

C.9.3 One-year extension of Option Period

After the four-year Option Period, for FY2014, the Government requires the option to extend the lease for operations, maintenance and the equipment for one additional year in quarterly increments. The Government estimates that the annual funding for this extension to be half of the FY2013 funding level (see Section C.4.3).

C.9.4 Additional R&D HPCS Augmentations

Over the life of the contract there may arise situations that will require the R&D HPCS to be augmented. One such situation might result if NOAA identifies a new requirement for HPC that did not exist at the time of contract award. A second situation might result if NOAA were to enter into an inter-agency agreement with another Federal agency to supply that agency with computational resources. In either situation the Government will request the Contractor to provide a proposal to meet any such requirement. The optional system augmentations are currently identified in Section B as Workstreams One through Nine inclusive. It is understood and agreed that should the augmentation option be exercised, the actual configuration acquired may be different than the Workstreams. In such case, the actual configuration being acquired will be negotiated.

C.9.5 Engineering Support

The Government requires additional expert-level engineering to address impending needs for a given workstream. Due to off-site meetings or presentations, some travel may be required as needed.

C.9.5.1 Applications Analyst

A senior applications analyst for porting, tuning, optimizing, and developing scientific applications in numerical weather prediction or climate prediction. The Applications Analyst will work with NOAA Application engineers, and Scientists. The Analyst is required to have direct access to vendor compiler development teams.

C.9.5.2 Systems/Network/Security Engineer

NOAA may require professional engineering services in support of its HPC facilities. These services may be for System, Network, or Security Engineering. Activities may include, by are not limited to the following:

- Install/remove vendor supplied OS and systems software (compilers, batch system, etc) upgrades.
- Manage upgrades for COTS or Community Supported software supplied via the contract.
- Use systems utilities to tune performance.
- Provide utilization and performance information to the extent the systems allow.
- Customize configurations of software and hardware.
- Collaborate with Contractors and Government staff.
- Comprehensively documenting plans and performed activities.
- Diagnose technical problems. Including distinguishing between hardware, software, and user errors.
- Work at an application level in the event job scheduling, interpretive utilities (such as scripting languages), compilers and runtime libraries are suspect.
- Support end users.
- Systems Analysis.
- Evaluate current methodologies and offer expert level advice on alternatives or target solutions.
- Comprehend and apply security upgrades. Collaborative work with Government IT security staff is essential.

C.9.5.3 Facilities Engineer

NOAA may require professional engineering services in support of its HPC facilities. These services may be architectural, electrical, mechanical or civil engineering services. Activities may include, but are not limited to the following:

- Facility Engineering Consulting Services
- General Engineering Studies
- Specific Engineering Studies
- Design Services
- Design-Build Services

C.10 Appendix A – Details of current NOAA R&D HPCS

C.10.1 Large-Scale Computing (LSC)

C.10.1.1 Boulder, CO

NOAA's Large Scale Computing located in Boulder consists of five logical clusters based on Intel 2.2GHz Xeon systems interconnected with MyriNet. Each node has two CPUs and 1 GB of memory. Two clusters contain 62 nodes each, one cluster contains 128 nodes, and two clusters contain 256 nodes. There are four front-ends with 4 GB each. There is also a test bed containing 12 dual-processor Opteron systems and 12 dual-processor Itanium systems.

C.10.1.2 Washington, DC

NOAA's Large Scale Computing located in Washington, DC consists of 40 IBM Power4 1.3 GHz Regatta H compute nodes, with a total of 1280 processors. Each node has 8 Logical Partitions (LPARs) with 4 processors per LPAR. Each processor has 1 GB of memory. The interconnect is an IBM SP Switch-2, which provides for multiple plain support for the switching fabric. Each LPAR has 2 SP Switch-2 PCI adapters.

The storage and I/O system is integrated with the switch and contains 4 additional dedicated Regatta H nodes each with 32 processors, configured in 4 LPARs with 8 processors per node. Each processor has 2 GB of memory. Each LPAR has two IBM SP Switch-2 adapters.

C.10.1.3 Princeton, NJ

NOAA's Large Scale Computing located in Princeton is designed for the batch processing of computationally intensive jobs. The LSC consists of 11 nodes with 3040 processors. Fast scratch disk is available from each node. The fast scratch disk has eight 1 Gb FC per host and is in a RAID 5+1 configuration.

There are eight SGI Origin 3000s running Irix 6.5.19f and consisting of:

2 hosts with	512 x 600 Mhz MIPS, 512 GB memory, 2.6 TB fast-scratch disk
5 hosts with	256 x 600 Mhz MIPS, 256 GB memory, 0.6 TB fast-scratch disk
1 host with	128 x 600 Mhz MIPS, 128 GB memory, 0.6 TB fast-scratch disk

There are three SGI Altix 3700s running Red Hat Enterprise AS with SGI Propack and consisting of:

2 hosts with	256 x 1.5 Ghz Intel, 512 GB memory, 1.4 TB fast-scratch disk
1 host with	96 x 1.5 Ghz Intel, 192 GB memory, 2 TB fast-scratch disk

In April 2005, NOAA will receive a performance increment of at least 1.8X above the Origin portion of the Large Scale Computing component.

C.10.2 Post-Processing and Analysis

C.10.2.1 Boulder, CO

There are four visualization servers based on Intel 1.7 GHz Xeon systems. They have dual ethernet connectivity (to the internal cluster network and to the internet via NOAA/FSL's LAN). There are also four cron servers based on 2.2 GHz Xeon systems.

C.10.2.2 Washington, DC

NOAA's HPCS system located at Washington DC contains 16 LPARs that are dedicated to single threaded batch jobs (mostly pre- and post-processing) and for interactive access to the parallel compute environment, which consists of the remainder of this HPCS. Additional post-processing and visualization is performed at several branch servers at NCEP, which are typically Origin 300 or Altix servers.

C.10.2.3 Princeton, NJ

NOAA's Analysis system located at Princeton has two nodes for analysis, post-processing and development work. The Analysis system is comprised of two SGI Origin 3900 systems and one SGI Onyx 3000 with visualization tools.

2 hosts with	96 x 600 Mhz MIPS, 96 GB memory, 3.9 TB fast-scratch disk
1 host with	4 x 400 Mhz MIPS, 4 GB memory, 0.2 TB scratch disk

The fast scratch disk is comprised of 48 x 1 Gb FC per host that connects to a XFS filesystem in a RAID 5+1 configuration.

The analysis computers are available for interactive use at all time. Parallel applications on up to 16 CPUs may be run for up to 8 hours. For applications that use more than 16 CPUs, use of the Large-Scale Computing is recommended, not required.

C.10.3 Storage and Archiving

C.10.3.1 Home File Systems (HFS)

C.10.3.1.1 Boulder, CO

There are two Data Direct Networks S2A 6000s each has 8 x 1 Gb/s FibreChannel ports. One has 9.2 TB of useable space and the other has 6.7 TB of useable space (this space excludes parity stripes). Files systems are served by a number of Linux-based NFS servers with read/write data rates of 40-50 MB/s each. There are six Dell 2650s with dual 1 GHz Pentium IIIs, one Dell 2550 with dual 933MHz Pentium IIIs, three dual-processor 2.2GHz Xeon systems, and one dual-processor 2.6GHz Xeon system. All of the systems have 2 GB memory, one Gigabit Ethernet interface and one 1 Gb/s FiberChannel HBA. These file systems provide long term (but not backed up)

data storage. These file systems also provide the /home file system for the clusters.

There is a 1.6TByte scratch file system based upon PVFS that utilizes commodity (ATA) disks for very short-term storage. This file system currently sustains around 250MB/s.

C.10.3.1.2 Washington, DC

The home file systems on NOAA's HPCS system located at Washington DC consist of 25.6 TB of disk space. Most of this disk space is configured as a General Parallel File System (GPFS), which is integrated with the switch as described in section C.10.1.2 above. GPFS utilizes 2 GB Fibre Channel adapters per storage and I/O LPAR.

C.10.3.1.3 Princeton, NJ

In Princeton, NOAA uses a unified /home filesystem for all scientific computers and workstations. This allows for users to log into various computational resources and have their environment and files follow them. This has required custom .cshrc and .login dotfiles that are designed for the unified home directory.

By default, each scientific user is limited to 10 GB of home directory disk space. /home is used primarily for model source code, batch job printouts, and files for workstation applications. Large data files are kept in /archive (the filesystem that is under HSMS).

The home file system is a 2.3TB SAN from a SGI Origin 3000 server. This file system is being served via CXFS within the HPCS and via NFS to the scientific workstations. Currently, the filesystem is 60% used by 10 million files. Backups are currently being done via xfsdump to the STK 9940B tapes in the silos.

C.10.3.2 Hierarchical Storage Management System (HSMS)

C.10.3.2.1 Boulder, CO

NOAA's HSMS in Boulder is based upon ADIC's StoreNext software. The robotic component is an ADIC AML/J with 8 LTO tape drives. Managed file systems (disk cache) use the DDN S2A 6000s mentioned above. Currently, 1 TB of space is allocated for two managed file systems. Over 88 TB is managed and is composed of over 4,000,000 files. Access to the HSMS is primarily via locally written get/put scripts, some limited direct access to the managed file systems is allowed.

C.10.3.2.2 Washington, DC

NOAA's HPCS in Gaithersburg, MD has access to two StorageTek Powderhorn silos, each with eight 9940B tape drives and about 1.25 PB capacity. The two silos are fully populated with tape cartridges. NOAA's HPCS in Fairmont, WV has access to one StorageTek Powderhorn silo, with four 9940B tape drives and about 1.25 PB potential capacity. The silo currently holds about 2300 tape cartridges. NCEP's experience indicates, on average, each 9940B cartridge can hold 250 GB. The HSMS is presently considered part of the operational system at NCEP. This storage system consists of tape storage with dedicated disk storage for staging data to be stored to, or retrieved from tape. This system is based on HPSS. Access to this system is through htar and PFTP commands, and a public domain IHSI Unix-like interface. Additional information on HPSS and IHSI can be found at:

http://www.hpss-collaboration.org
http://www.sdsc.edu/Storage/hsi/

NCEP currently writes about 2TB/day to tape and by the fourth quarter of 2005 all available capacity will have been consumed. The tape archive layout is the same at both the Gaithersburg and Fairmont locations; the storage devices are connected to the computational cluster by dual Gigabit Ethernet connections through a Cisco 6513 router. Each computational cluster supports "interactive" nodes where users control HPSS functions.

C.10.3.2.3 Princeton, NJ

NOAA's Storage Area Network (SAN) in Princeton has 22.5TB of capacity that is accessible through switched 2 Gb/s FC. The LSC in Princeton has eight 2 Gb/s channels per node to this SAN. The AC in Princeton has twenty-four 2 Gb/s channels per node to this SAN.

NOAA's HSMS in Princeton uses SGI's Data Migration software to provide a data archive via the /archive filesystem. This software manages both a disk and a tape copy of each file in /archive. This is done transparently to the user, under one file name.

The HSMS software has a 15.8 TB SAN for file staging. The disk SAN is connected to the rest of the HPCS by sixteen 2 Gb FC per node. There is currently 2.5dPB stored in 10.7 million files on 9940B (200GB/tape) and 9840 (20dGB/tape) tapes. There are also 2.4 million disk-resident files that are smaller than 64 KB.

To archive a file, a user simply copies or moves the file into their /archive/<user> directory from any node in the HPCS. Once a new file is present in /archive, data migration will automatically make a tape copy of the file. At first, the disk copy of the file is also kept available. If the file is not accessed for several days, data migration will remove the disk copy of the file, keeping only the tape copy. The next time this file is accessed, it will be

"staged" from tape to disk. Subsequent accesses will then be from the disk-resident copy of the file. However, files may be moved between subdirectories, renamed, or removed without causing the file to be "staged" from tape to disk.

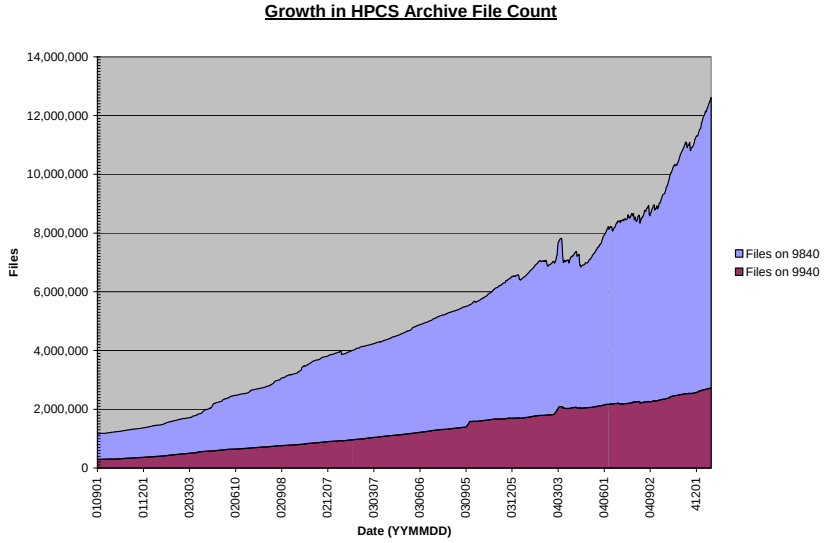

Figure 2 - Growth in tape-resident files on HSMS in Princeton

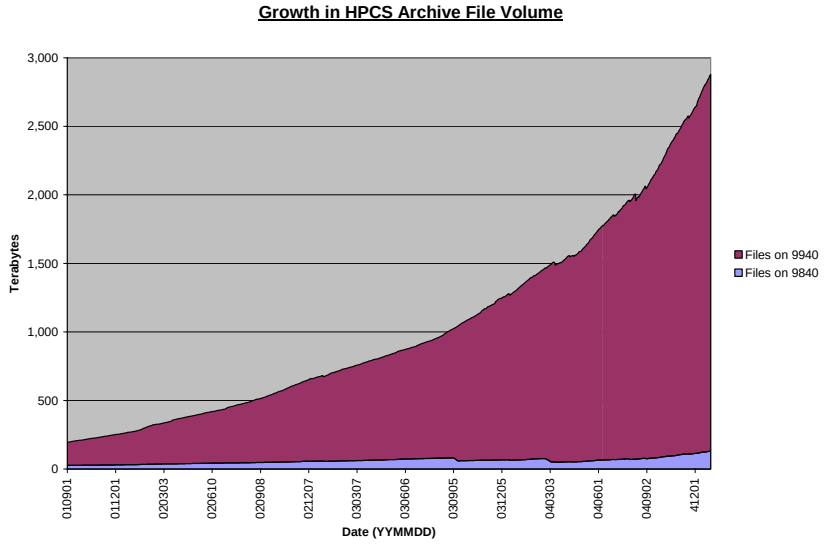

Figure 3 - Growth in tape resident storage on HSMS in Princeton

C.10.4 Networking

C.10.4.1 Wide Area Networks (WANs)

	Internet	Internet2	Other
Boulder	155 Mb/s	310 Mb/s	NLR is expected Q3FY2005
Washington, DC	622 Mb/s	155 Mb/s	
Princeton	15 Mb/s	100 Mb/s	1Gb/s – Princeton University Sayre Hall (Forrestal campus)

C.10.4.1.1 Boulder, CO

NOAA's Boulder facility is connected to the Abilene network via the Front Range GigaPOP at 310Mb/s. A 155Mb/s connection is available to Boulder through a commercial Internet provider. By the third quarter of Fiscal Year 2005, Boulder will be part of the National Lambda Rail (NLR) with connectivity of at least 1000Mb/s.

C.10.4.1.2 Washington, DC

NOAA's Camp Spring, MD facility is connected to Internet2 with an OC3. An OC12 internet link is presently used close to capacity. This setup is inherited from the previous operational use of the present HPCS in Washington, DC. It is expected that future HPCS systems will rely more on Internet2.

C.10.4.1.3 Princeton, NJ

NOAA's Princeton facility is connected to Princeton University's Sayre Hall Building via 1Gb/s Ethernet. NOAA connects to Princeton University through a 100Mb/s microwave link that is accessed through the Sayre Hall Building. The 100 Mb/s Internet2 connection traverses the Princeton University connection. NOAA connects to the Internet through a 9Mb/s connection provided by a commercial Internet provider.

A Cisco 2600 router and a Juniper M7i router are used to connect to the commodity Internet, Princeton University, and subsequently Internet2. These exterior border routers, along with the local DMZ networks, are segmented off from the LAN by redundant Cisco PIX 535 firewalls.

C.10.4.2 Local Area Networks (LANs)

C.10.4.2.1 Boulder, CO

NOAA's Boulder LAN backbone that connects to the HPCS is based upon Gigabit Ethernet.

C.10.4.2.2 Washington, DC

NOAA's Washington, DC LAN that connects to the HPCS consists of Cisco Catalyst 3500 XL switch at 100 Mb/s. Apart from several hundred desktop systems, the LAN includes several servers. Servers are typically high-end

SGI Origin 300 or SGI Altix servers which are used for storage, post-processing and development.

C.10.4.2.3 Princeton, NJ

NOAA's Princeton LAN backbone that connects to the HPCS consists of Brocade, Cisco, Enterasys and Juniper equipment. The HPC backbone ethernet network is handled by a Cisco Catalyst 6509. The HPC nodes are connected at both 100 Mb/s and 1Gb/s. To support the large data requirements of the system, Brocade Silkworm and Cisco Catalyst switches are used to connect the SAN infrastructure to the HPC nodes. Local users connect to the LAN via distribution switches at either 100Mb/s or 1Gb/s.

Basic network services provided include: DNS, LDAP, Mail, NFS, NIS, NTP, and Printing.

C.10.4.3 Batch queuing systems

C.10.4.3.1 Boulder, CO

NOAA's HPCS in Boulder uses the open source version of Sun Grid Engine (SGE). Currently version 5 is in use on the primary set of clusters. Version 6 will be in use by November 2004. With version 5, a custom prescheduler is used to manage jobs based upon the account specified by the user. Accounts are given a maximum number of CPUs to be in use at any given point in time, a maximum number of jobs in use at any given point in time, a maximum job length and maximum priority. Certain accounts are also given dedicated resources (this will be replaced by resource reservations with version 6). Accounts are members of classes (classes can be members of classes as well), classes have total resource limits as well that the prescheduler takes into account. The qsub command is "wrapped" with a custom script that verifies that the user is a member of the account and hasn't exceeded any of the per job maximums. The "wrapper" also modifies priority 0 jobs to use an alternate backfill account associated with the primary account. Typically at least 70,000 jobs per week pass through the batch system.

C.10.4.3.2 Washington, DC

NOAA's HPCS in Washington, DC uses LoadLeveler. The system is set up with separate partitions for serial and parallel jobs (see section C.10.2.2 above). Queues have been assigned to provide access to specific job resource requirements and priority. Accounting is presently performed for system monitoring only, but is deemed essential is future R&D resource allocation.

C.10.4.3.3 Princeton, NJ

NOAA's HPCS in Princeton uses Grid Engine Enterprise Edition 5.3. This is a POSIX 1003.2d batch environment (with extensions) that has been

provided by Raytheon. IRIX cpuset support has been added. More information on the batch queuing system at http://gridengine.sunsource.net/

Grid Engine projects are used to track usage and assign higher job scheduling priority to some activities. Only users designated by their team may use these projects.

Each calendar month, a running total is kept of each group's CPU usage. Each group is assigned a monthly CPU allocation by the GFDL Director. When a group has exceeded its monthly allocation, that group's jobs are blocked from running, however the group is still allowed to run jobs in the windfall queue.

C.10.5 Software

C.10.5.1 COTS

C.10.5.1.1 Boulder, CO

NOAA's HPCS in Boulder currently has licenses to use IDL on the visualization servers. The HPCS in Boulder also has licenses for the Portland Group Fortran and C compilers as well as the Intel Fortran and C compilers.

C.10.5.1.2 Washington, DC

NOAA's HPCS system located at Washington DC presently has licenses to use the following COTS software on the LSC: TotalView, Vampir, IDL, Matlab. Also available are the following libraries: Visual Numerics IMSL, ScaLaPack.

C.10.5.1.3 Princeton, NJ

NOAA's HPCS in Princeton currently has licenses to use the following COTS software on the HPCS: CASEVision/WorkShop, MIPSpro f90 Compiler, Etnus TotalView, F-lint, IDL, Legato Networker, Maple, Mathematica, Matlab, MIPSpro f90, NAG Fortran Libraries, NAG Iris Explorer, and S-Plus.

C.10.5.2 Community Supported Software

C.10.5.2.1 Boulder, CO

NOAA's HPCS in Boulder currently utilizes the following open source software: SUSE Linux, Fedora Linux, Ferret, NCAR graphics, GrADS, and NetCDF utilities.

C.10.5.2.2 Washington, DC

NOAA's HPCS system located at Washington DC presently utilizes the following open source software: GrADS, NCAR graphics, ImageMagick, NetCDF utilities, GEMPAK, and ISMF.

C.10.5.2.3 Princeton, NJ

NOAA's HPCS in Princeton currently utilizes the following open source software: Ferret, Grace, GrADS, NCAR graphics, and NetCDF utilities.

C.10.6 Reliability, availability and support

C.10.6.1 Boulder, CO

The current contractual uptime requirement for the HPCS in Boulder is significantly exceeded by the incumbent. For carefully monitored jobs, the reliability of the system in terms of delivery of results to an end user is over 98.5%.

The current facility has 250kVA available to the current HPCS and commensurate cooling.

The incumbent supplies two on-site software engineers to support the facility. A program manager is on-site over 50% of the time. Other software engineers work remotely on the system a small (<10%) percentage of time to provide additional support.

C.10.6.2 Washington, DC

Reliability:

Reliability is expressed in terms of Mean-Time-Between-Failure (MTBF). A failure is defined as any scheduled or unscheduled event that triggers downtime. Individual components of the system can fail and not be counted as a system failure if the system has sufficient redundancy, error correction or resiliency to allow the failure to not affect individual jobs running in production or development.

Availability:

Availability is determined by computing the ratio of total batch computation processor hours available for execution of the operational and developmental suites to the total batch computation processor hours each month. The time a batch computation processor is available for execution is determined by subtracting processor downtime from wall-clock time. Spare nodes or processors may be configured into the batch computation processor pool upon failure of a node and/or processor in the batch computation pool to reduce downtime, but downtime accumulates until the spare is made available in the system for execution. Failure(s) of other components of the HPCS that result in batch computation processor(s) being unable to run jobs is equivalent to failure of those batch computation processors themselves.

Downtime:

Downtime is that period of time when the HPCS or a component thereof is inoperative. Downtime shall commence at the time when NOAA contacts the Vendor's maintenance representative at the designated point of contact or the Vendor's answering service or other continuous telephone coverage provided to permit NOAA to make such contact to report a failure. Downtime shall end when the HPCS is returned to NOAA in operable condition. The HPCS, or individual component thereof, may be declared inoperative while problem diagnosis takes place. Downtime includes any time required for operating software regeneration, reinstallation, or reconfiguration. During a period of downtime, NOAA may continue to use operable components of the HPCS when such action does not interfere with maintenance of the inoperable components of the HPCS.

Support:
The Government requires 7x24x365 System Administration support. Current staffing levels are at 3 System Administrators, 1.25 Application analysts and one part time HSM specialist.

C.10.6.3 Princeton, NJ

The HPC System continues the Government's historically high utilization of its computing resources. Reliability, availability, and Contractor support are considered fundamental aspects of the HPCS

Downtime
Downtime is that period of time when all of an HPCS component's workload cannot be accomplished due to a malfunction in the Contractor-maintained equipment or software, or when the HPCS or a component of the HPCS is released to the Contractor for maintenance. Periods of Remedial and Preventative Maintenance count as downtime.

Null time is that period of time when the workload cannot be accomplished due to circumstances beyond the scope of the contract. Null time does not count as downtime.

Downtime for each HPCS component is based on the fraction of the resources available for that component's workload, arrived at through consultation between the Government and the Contractor, and determined ultimately by the Government. Downtime is accumulated on the LSC, Post-Processing and Analysis computers if they are not able to perform the workload when either the HSMS or HFS is down.

The Contractor provides the Government a designated point of contact to request maintenance. The Contractor maintains escalation procedures that allow the Government round-the-clock telephone contact with knowledgeable Contractor staff should the designated point of contact be unavailable.

A component's downtime shall commence at the time the Government makes a bona fide attempt to contact the Contractor at the designated point of contact. At

this time the Government begins a log of the problem. Information to be entered into the log is determined by the Government.

A component's downtime excludes any time in which the Government denies the Contractor maintenance personnel access to the malfunctioning hardware and/or software.

A component's downtime ends when the computer is returned to the Government in operable condition as determined by the Government, ready to perform all of the workload.

Preventative Maintenance is completed outside of primetime hours (7 am – 7 pm).

The testing and installation of every major operating system release installed at the request of the Government and one (1) minor operating system release installed at the request of the Government during any annual period will count as downtime.

Preparation for the execution of post-upgrade LTDs, including any benchmark development by the Contractor, associated with the agreed-upon upgrades proposed at contract award, will count as downtime.

Availability

Proposed throughput benchmark performance levels are combined with the proposed availability level to determine a measure of overall proposed system-life throughput for the LSC and for the Analysis Computer. The actual throughput will be measured on a periodic basis, to be determined by the Government and Contractor, by combining the demonstrated benchmark performance with the operational use time on the LSC and on the Analysis Computer. The proposed performance levels must be met for each measurement of actual throughput regardless of past delivery of suites.

Shortfalls in throughput on the LSC or on the Analysis Computer are made up with new equipment brought in at no additional cost to the Government. Using the demonstrated benchmark performance on the upgraded LSC or Analysis Computer, the Government calculates how long the upgrade shall stay in place to compensate for the shortfall in throughput. This calculation is rounded up to a multiple of 6-month intervals to minimize disruption.

At the option of the Government, shortfalls in throughput on the LSC or on the Analysis Computer due to downtime shall cause downtime credits to accrue. These downtime credits shall be in lieu of bringing in new equipment. Downtime credits shall accrue on the HSMS or HFS.

To better reflect the Government's computational needs over time, changes in the LSC and AC throughput benchmarks are made by mutual agreement between the Government and the Contractor throughout the life of the HPCS.

Accumulated computational cycles (in CPU-hours) that are lost when jobs are lost due to component failure or component reboot are not counted toward the system-life throughput calculation. If the accounting software cannot report the accumulated computational cycles, it will be assumed that 4 CPU-hours were lost for each processor on which a job ran.

All performance levels proposed for hardware and software upgrades must be met regardless of past delivery of suites

Uninterruptible power supplies (UPS) is required for all components of the HPCS. The UPSes provide sufficient power during environmental failures to gracefully shut down all components of the HPCS.

Support

The Government requires at least two software engineers (to provide a comprehensive system administration service), at least one hardware engineer, and at least one applications analyst available on site for at least eight hours within GFDL's primetime window, five days per week. Additional on-call support is provided 24 hours per day, 7 days per week, with a 2-hour response time. The Government reserves the right to substitute hardware engineers with software engineers or application analysts during the life of the contract on an as-needed basis.

The Government requires an itemized list of all Contractor-supplied hardware and software items, and documentation of these items.

C.11 Appendix B - Available Government Facilities

This document provides descriptions of five government-furnished facilities, four of which are designed to support high-performance computer systems and the fifth which involves an existing computer room and office space within NOAA's administrative computing facility. All five facilities are available for possible use by Offerors to house systems under the NOAA HPC R&D contract, subject to the availability of facility resources as projected in Section C.11.11 below under the assumptions provided therein and subject to the facility terms and conditions provided in Section C.5.6**.** Two of these facilities, designated as BLDR-1 and BLDR-2, are located in the David Skaggs Research Center (DSRC), 325 Broadway, Boulder, CO. The third, designated as PRTN, is located in Geophysical Fluid Dynamics Laboratory (GFDL) building complex, referred to as the "Princeton Complex" below, at 201 Forrestal Road, Princeton University Forrestal Campus, Princeton, NJ. The fourth facility, designated as FAIRMONT, is space located in the NASA IV&V Facility which is leased from NASA by NOAA to house NOAA's backup NCEP supercomputer. The term of the current lease runs through September 30, 2008, but is expected to be continued. The fifth facility, designated as LARGO, is located in a commercial facility, known as the NOAA Information Technology Center (ITC), that is leased by NOAA through GSA for housing NOAA's administrative computer systems. The NOAA ITC is managed by the Information Systems Management Office (ISMO) of NOAA's Financial and

Administrative Computing Division. The current lease of the facility containing LARGO is a five-year lease that began in mid-February 2004 and will end one day earlier than this date in 2009. The lease contains an option for a five-year extension beyond the facility's base period. At this juncture, it appears there are no plans to remove CAMS from the NOAA ITC. Per GSA, lease cost is the lowest available within near proximity to the Capital Beltway. The Largo Metro Station is opening December 18 literally at the back fence, which will enhance access to the facility.

BLDR-1 currently houses NOAA's JET computer system operated by OAR's Forecast Systems Laboratory under a contract with HPTi. The BLDR-1 facility will not be available until October 2006. BLDR-2 is a facility currently under construction at DSRC and is expected to be available for use in October 2005. PRTN currently houses NOAA's HPCS operated by OAR's Geophysical Fluid Dynamics Laboratory under a contract with Raytheon. FAIRMONT currently house NOAA's operational backup supercomputer. The LARGO facility currently contains some of NOAA's administrative computer systems but has additional computer room space available to support components of the R&D HPCS. This space will be available for use in March 2005.

C.11.1 Layout and Physical Dimensions of Computer Room

C.11.1.1 Computer Room Layout

BLDR-1
Figure 1 shows the computer room layout for BLDR-1. The area within the dotted line will be available in October 2006. This room is only designed for medium-density cooling configurations.

BLDR-2
Figure 2 shows the planned computer room layout, which is currently in the design phase. It will be designed with both overhead and under floor extreme-density cooling. The uninterruptible power supplies (UPS) will be fed from utility power only (i.e., the room will not be connected to the emergency motor generator). This room will be completed and available for use by the Offeror by October 2005.

BLDR-1 & BLDR-2 Building Diagrams
Offerors requesting building diagrams or related documents of federal government facilities shall be required to have an authorized representative execute a non-disclosure form as required under GSA Order PBS 3490.1. Specific room floor plans are available upon request and are not subject to these regulations.

PRTN
Figure 3 shows the computer room layout for the current system, but with the following planned modifications: move silos onto the northern hardpan and construct five office cubicles on the southern hardpan. References to the front of the room in the following discussion refer to the bottom of the figure (nearest to the Operators Room), while the back of the room is at the top of the figure.

Figure 4 (attached) shows the overall Computer Building layout. The rooms adjacent to the Computer Room as shown at the bottom of the figure from left to right are:

- Loading Dock, which is designed to accept deliveries from 18-wheel trucks.
- Storage Room adjacent to the Loading Dock, which also serves as a receiving/staging area for deliveries to the Laboratory.
- Conference Room (to be constructed)
- Office (to be constructed)
- Operators Room, which serves as the control room for computer operations as well as security monitors for the Computer Room as well as outside building access points for the Computer Building and Main Building.
- Printer/User Output Room, which contains local Computer Building printers as well as user output bins.
- Operations Lounge.

FAIRMONT
Figure 6 shows the space NOAA has leased from NASA within the NASA IV&V Facility. NOAA is currently leasing 6,800 sq. ft. of space, but this space could be expanded to include an additional 500 sq. ft. to provide office space in support of this contract.

LARGO
Figure 5 indicates the rooms that are available within the NOAA ITC. The current Xerox Room involves 600 sq. ft. of raised floor with dimensions of 20 feet by 30 feet. The Media Room has 320 sq. ft. of raised floor with dimensions of 16 feet by 20 feet.

Figure 6 shows the layout of the surrounding rooms adjacent to the offered facility.

C.11.1.2 Location of Computer Room and Characteristics of Surrounding Campus

BLDR-1 & BLDR-2
Both BLDR-1 and BLDR-2 are located within the David Skaggs Research Center (DSRC) in Boulder, CO. Due to the large number of visitors, the following website was developed to assist with locality information with regard to the site: http://boulder.noaa.gov/. This website will display maps, local information, driving directions, etc. Regarding specific locations: BLDR-1 is located in the “B” Block of the DSRC, on the 2nd floor, and BLDR-2 is located in the “A” Block of the DSRC, in the Garden level (basement).

PRTN
The Computer Room is in the Computer Building, which is one of two buildings in the PRTN Complex located at 201 Forrestal Road, Forrestal Campus, Princeton,

NJ 08540 on Site B of Princeton University's Forrestal Campus. This campus is currently devoted to university research and is intended by Princeton University to be developed in the future as an office park on the U.S. Route 1 corridor. The nearest airport is the Trenton-Mercer Airport, which is roughly 12 miles away. The nearest highway, U.S. Route 1, is roughly 1/3 mile away.

FAIRMONT
The Fairmont facility is located within a technology park adjacent to Interstate 79 running North and South through West Virginia. The following website can provide addition information regarding directions and local information: http://www.ivv.nasa.gov.

LARGO
The facility's address is ISMO, 1221-D Caraway Court, Largo, MD 20774-5381. Space to be made available involves the Xerox Room (20 ft x 30 ft) and the Media Library (16 ft x 20 ft). Other areas could be made available through relocation of the Lab/Conditioned Storage area and/or converting an office area, which was originally computer-conditioned space. These last two areas do not currently have raised floor, so installation of raised floor would involve additional cost. Specifically, one concrete floor area with a 12-foot-high ceiling could be converted to raised floor at either 724 sq. ft. by retaining the existing standalone office, or 864 sq. ft. with the office removed. An adjoining concrete floor area of 576 sq. ft. could be made available and could be added as contiguous space, though removal of a wall, removal of existing unused plumbing, and raising the ceiling would be required.

C.11.1.3 Physical Dimensions of Computer Room

BLDR-1
Figure 1 indicates the computer room layout for BLDR-1. The entire computer room is 3600 square feet in size, with dimensions of 60 feet by 60 feet. The area within the dotted line in the figure will be available in October 2006 and is estimated to be approximately 2250 sq. ft.

BLDR-2
Figure 2 indicates the computer room dimensions and layout for BLDR-2. The entire computer room space is approximately 2100 sq. ft. A portion of this space is used for a substantial, Americans-with-Disabilities-Act (ADA)-compliant ramp for room access. 1500 sq. ft. of raised floor space is available for equipment. An adjacent room contains an additional 325 sq. ft. of raised floor space, separated from the main room by a wall.

PRTN
Figure 3 indicates the computer room layout for PRTN. Figure 4 shows the location of the computer room within the Computer Building of the PRTN Complex. The entire computer room is 10,004 square feet in size, with dimensions of 122 feet by 82 feet; this includes the UPS Room, which is located on the hardpan on the right rear corner of the Computer Room.

FAIRMONT
Figure 6 shows the current raised floor space at the NASA IV&V Facility that is leased by NOAA for NOAA's backup NCEP supercomputer. The room is a large open area (68 ft. X 96 ft.) with support pillars distributed throughout the room. An additional area (10 ft. X 37 ft.) is also leased by NOAA for office/administrative use. Also, an additional 500 sq. ft. could be made available by NASA for this proposal if needed. NOAA is currently only occupying approximately half of the large area for the backup NCEP supercomputer thus leaving approximately 3,200 sq. ft. of the large room available for this proposal with an optional 500 sq. ft. of office/administrative space.

LARGO
Figure 5 indicates the available rooms. The current Xerox Room involves 600 sq. ft. of raised floor with dimensions of 20 feet by 30 feet. The Media Room has 320 sq. ft. of raised floor with dimensions of 16 feet by 20 feet. Possible additional raised floor space could be obtained in the amount of either 724 or 864 sq. ft., as discussed above in C.11.1.2. Thus the raised floor space available without modification totals 820 sq. ft. Installation of additional raised floor could produce a total of up to 1,684 sq. ft.. An adjoining space of 576 sq. ft. could also be available, currently as non-raised floor space.

C.11.1.4 Raised Floor Space

BLDR-1
A total of 3600 sq. ft. of raised floor is in BLDR-1. 2250 sq. ft. of this space will be available in October 2006.

BLDR-2
A total of 1500 sq. ft. of raised floor will be in BLDR-2, all of which will be available once construction of the room is completed in October 2005.

PRTN
The raised floor area in PRTN totals 7052 sq. ft. with dimensions of 86 feet by 82 feet.

FAIRMONT
As indicated above, there is approximately 3,200 sq. ft. of raised floor space currently available at the Fairmont facility with an optional additional 500 sq. ft. available for office/administrative space. Even though the space is currently available, modifications to meet any necessary power and cooling requirements may not be completed until the summer of 2006, depending upon such requirements.

LARGO
As indicated above, there is a total of 920 sq. ft. of raised floor in the largo facility. This space will be available in March 2005. Additional raised floor space can be added to this facility through installation of more raised floor by the Contractor, producing a total of up to 1,684 sq. ft.

C.11.1.5 Non-Raised Floor Space and Equipment Staging Areas

BLDR-1 & BLDR-2
There is no non-raised floor in either computer room. The computer rooms themselves are used as staging areas.

PRTN
The non-raised floor on the left side of the room is 1476 sq. ft. with dimensions of 18 by 82 feet. The non-raised floor on the right side is 936 square feet, with dimensions of 18 by 52 feet, reflecting reduced non-raised floor space due to the presence of the UPS Room. Figure 3 indicates the planned future location of the five (5) StorageTek silos, four of which are currently located on the raised floor but will be relocated this winter to the locations on the hardpan as indicated in the figure.

FAIRMONT
There is no non-raised floor in either computer room. The computer rooms themselves are used as staging areas.

LARGO
There is non-raised floor space available in the facility that can be used for storage and assembly as well as office space.

C.11.1.6 Space for Vendor Personnel, Maintenance Space, and Vendor Storage

BLDR-1 & BLDR-2
The Government will supply two (2) 150-sq. ft. offices and approximately 100 square feet of lab space for use by the Contractor. None of this space will have furniture or lab benches. The space will have up to four (4) telephones as well as adequate LAN connections.

Washington, DC
NCEP can accommodate two on-site personnel at the World Weather Building and its annexes. However office space is extremely limited, so contractors should limit office space requirements as much as possible.

PRTN
Vendor support personnel (2 Computer Engineers and 2 Software Engineers) currently occupy three (3) rooms in the Computer Building. Equipment storage and maintenance space is provided on the left hardpan in the Computer Room. Plans are being made to construct five (5) offices on the left hardpan in the computer room to provide additional vendor office space while freeing up two of the current vendor rooms for other use by the Government.

FAIRMONT
As stated earlier, approximately 500 sq. ft. of additional raised floor could be provide by NASA to accommodate office/administrative space or could be used as needed by NOAA or the contractor.

LARGO
Some of the existing space in the facility can be re-configured to provide office space for contractor support personnel. With no modifications to existing office area, the facility could accommodate up to 10 work spaces. With modifications, 30 or more office space may be available.

C.11.1.7 *Height of Ceiling Above Raised Floor*

BLDR-1
Drop ceiling height = 8.5 feet

BLDR-2
Drop ceiling height = 10 feet

PRTN
Drop ceiling height = 9.5 feet

FAIRMONT
Drop ceiling height = 10 feet

LARGO
The ceiling height above raised floor space is 9 feet. In the concrete floor 724/864 sq. ft. area it is 12 feet.

C.11.1.8 Maximum Allowable Height of Equipment

The following equipment height are mandated by fire codes and cooling limitations.

BLDR-1 & BLDR-2

Due to fire code and cooling limitations, the maximum allowable rack height will be 84”. A waiver of this restriction may be allowed, up to 94 inches, depending on the location and placement of the equipment. Modifications to the overhead sprinklers, with approval from the GSA Fire Protection Engineer, may be necessary. It is strongly recommended that vendors who are contemplating the use of tall equipment submit proposed drawings of equipment layouts and specifications to the government prior to submission of their proposal. The government will attempt to provide a rough estimate of the costs that will be born by the vendor to accommodate the equipment.

PRTN
Due to fire code regulations, the maximum allowable rack height will be no more than 18” below the drop ceiling height.

FAIRMONT

Due to fire code regulations, the maximum allowable rack height will be no more than 18” below the drop ceiling height.

LARGO
Due to fire code regulations, the maximum allowable rack height will be no more than 18” below the drop ceiling height.

C.11.1.9 Space Below Raised Floor

The space below the raised floor is defined as height from the sub-floor base to the top of the raised floor.

BLDR-1
Raised floor height = 12 inches

BLDR-2
Raised floor height = 24 inches

PRTN
Raised floor height = 24 inches (except for the deeper chilled water trench, 4 feet deep, that extends down the middle of the room as indicated in Figure 4).

FAIRMONT
Raised floor height = 24 inches

LARGO
Raised floor height = 18 inches

C.11.2 Installation Characteristics and Raised Floor Capacity

C.11.2.1 Physical Access for Equipment Installation

BLDR-1 & BLDR-2
Loading Dock - Standard, designed to accommodate 18-wheeled semi-trucks.
Access Path –
Corridors - 8” raised floors and 7-ft high doorframes
Elevator – Freight Elevator with 8000-lb. Capacity
BLDR-1: 25’ from Loading Dock to the freight elevator and then 50’ to the computer room
BLDR-2: 25’ from the Loading Dock to the freight elevator and then 150’ to the computer room, down and up ADA-compliant ramps.

PRTN
Loading Dock – Standard, designed to accommodate 18-wheeler semi-trucks.
Access Path – Equipment passes through an entry door from the Loading Dock into the Storage Room and then onto a hardpan staging area in the south corner of the Computer Room - a total distance of roughly 30 feet. The two sets of double doors along this path have clearances of 85 inches high by 70 inches wide.

FAIRMONT

Loading Dock - Standard, designed to accommodate 18-wheeler semi-trucks. There is a powered overhead door with manual locks that is tied into the security system. The loading dock/staging area is approximately 600 sq. ft. The pathway into the raised floor area from the loading dock area is accommodated with double door ways that are 9 ft. high and 7 ft. wide. The pathway also runs over raised floor; thus, additional floor protection must be used for transporting racks over 1,000 lbs. over the raised floor

LARGO
Loading Dock - Standard, designed to accommodate 18-wheeler semi-trucks. There is a powered overhead door with manual locks that is tied into the security system. The loading dock/staging area is 600 sq. ft. The path into the raised floor area is from the loading dock up a reinforced ramp. The ramp area and path to it are 6 feet wide.

C.11.2.2 Staging and Assembly Areas

BLDR-1 & BLDR-2
All staging and equipment assembly must be performed within the computer room.

PRTN
Equipment may be staged and assembled on the hardpan in the computer room immediately adjacent to the entry from the Storage Room and the Loading Dock. This non-raised floor area is at least 18’ wide by 20’ deep.

FAIRMONT
All staging and equipment assembly must be performed within the computer room.

LARGO
Equipment may be staged and assembled in areas outside of the computer room.

C.11.2.3 Loading Capacity of Raised Floor

BLDR-1
Computer Room Raised Floor Specs: ConCore SF 1250 Bolted Stringer: Concentrated Load: 1250 lbs.; Uniform Load: 300 lbs./ft²; Ultimate Load: 3850 lbs.; Rolling Load: 1000 lbs. (10 Passes)
Raised floor Specs (adjacent hallways): ConCore SF 1250 Cornerlock: Concentrated Load: 1250 lbs.; Uniform Load: 300 lbs./ft²; Ultimate Load: 3750 lbs.; Rolling Load: 1000 lbs. (10 Passes)

Floor tiles are 2’ x 2’ and are shown by location in the Figure 1 drawing. The dotted squares represent perforated tiles. Network and power connections are made via 5” round ports within the solid tiles only. All tiles, unencumbered by racks or other equipment, can be relocated for improved airflow, if necessary.

BLDR-2
Computer Room Raised Floor Specs: ConCore SF 1250 Bolted Stringer: Concentrated Load: 1250 lbs.; Uniform Load: 300 lbs./ft²; Ultimate Load: 3850 lbs.; Rolling Load: 1000 lbs. (10 Passes)

Raised floor Specs (adjacent hallways): Concrete floors

PRTN
The raised floor in the Computer Room is made by Tate and is designed to support a uniform live load of 250 pounds per square foot, with a deflection of not more than 0.040 inch. The raised floor is electrically interconnected to provide a common electric reference.

Most of the raised floor, indicated as 2' x 2' square tiles in Figure 3, was replaced as part of the site preparation for the current Raytheon contract. The exceptions for this raised floor upgrade were for tiles under the following equipment: the two oldest StorageTek silos (when located on the raised floor), the MGE 250-kVA UPS, the Dataflow air-handler along the rear wall of the Computer Room, the Liebert 125-kVA PDU, and the EPE 125-kVA PDU.

Adjacent Non-Raised Floor and Pathway to Loading Dock: Concrete floors

FAIRMONT
Computer Room Raised Floor Specs: Tec-Cor II Screwed Stringer: Concentrated Load: 1250 lbs <0.095"; Uniform Load: 300 lbs < 0.040"; Ultimate Load: 3600 lbs.; Rolling Load: 1000 lbs < 0.040". (10 Passes) Impact Load: 150 lbs at 36" drop.

Raised floor Specs (adjacent hallways): Tec-Crete II Screwed Stringer: Concentrated Load: 1500 lbs <0.080"; Uniform Load: 500 < 0.040"; Ultimate Load: 3000 lbs.; Rolling Load: 1500 lbs < 0.040" (10 Passes); Impact Load: 150 lbs at 36".

LARGO
Approximately half of the raised floor area uses cement filled tiles rated at 1,250 psi. If greater loading capacity is needed, the cost of replacing this floor and substructure would be approximately $16K for flooring and $5K labor. This flooring would be rated at (Static Loads) Concentrated Loads = 2500 psi / Uniform loads = 625 psi / Ultimate loads = 6900 psi. *Source http://www.accessfloorsystems.com/ for ConCore 2500 floor tiles.

C.11.3 Power Facilities

C.11.3.1 Power Service to Building

BLDR-1 & BLDR-2
480/277-volt main switchboard, rated for 3000 amps and 65,000 AIC. The gear has integrated IMPACC monitoring software. All power is fed from a single utility

substation. Power is then distributed via step-down transformers and panel boards.

PRTN

The Princeton Complex receives its power from Public Service Electric and Gas (PSE&G) Company. A PSE&G utility substation with a 2500-kVA, 13200-to-4160-volt, oil-filled transformer and 4160-volt switchgear provides electrical service to the Princeton Complex. This substation is located outside of the southwest corner of the Computer Building directly adjacent to the parking lot. This substation provides power support to the Princeton Complex as well as to several of the other buildings on the B site of the Forrestal Campus. Power usage for these other buildings is primarily for offices, although research activities in some of these other buildings occasionally require substantial power from the substation. The power load shown on the meter servicing these other buildings recently showed a load of 1070 kVA. PSE&G has indicated that it will upgrade the capacity of this substation, if required; however, the underground feeder line connecting the substation to the main PSE&G grid (located on nearby U.S. Route 1) would be an additional cost to the customer.

An underground 4160-volt feeder, dedicated to the Princeton Complex, is routed from the utility substation to separate building substations located within the Princeton Main Building and Computer Building. The Main Building substation (1500-kVA 4160-to-480-volt transformer the actual rating for this transformer is 1725-kVA, but Princeton University mandates that its usage not exceed 1500-kVA), located on the ground floor of Princeton's Main Building, provides power to the Main Building and to the Chilled Water Plant for the Princeton Complex. A recent reading from the Main Building substation showed a peak load of 1000 kVA, which probably occurred as a result of peak cooling load during the summer.

The Computer Building substation is located in the Transformer Room, the location of which is shown in Figure 4. This substation is comprised of a 4160-volt air interrupter switch, a 1500-kVA silicone-filled transformer, and a 2000-ampere, 480/277-volt main switchboard. The equipment was installed around 1980 when the Computer Building was constructed and provides power to the Computer Building. A recent reading from the Computer Building substation showed a peak load of 540 kVA.

The Government will install separate power meters for the two substations described above. This separation will allow two separate accountings of monthly electrical utility usage, one for the Computer Building substation, the usage of which is primarily for the installed systems in the Computer Room, and the other for the Main Building substation, the usage of which is dominated by the chilled water plants. The Contractor shall be responsible for paying the PSE&G electric utility bill for the Computer Building transformer meter plus an identical amount that reflects the portion of the Main Building transformer meter bill associated with cooling the installed system. (See section H.19)

The lighting, large mechanical equipment (pumps, A/C units, etc), and some computer equipment are served at 480/277 volts via panel boards located throughout the Computer Building. The building receptacles, small motors, desktop computers, computer room equipment, and similar loads are served at 208/120 volts via step-down transformers and panel boards.
All three chillers, described below, use the Main Building substation for power.

FAIRMONT
Fairmont has two (2) commercial feeds by Alleghany Power - 4160 V feeders with step down transformers to 480V three phase. All power is fed from a single utility substation with redundant capability. The 480/277-volt main switchboard is rated for 4000 amps. The lighting, large mechanical equipment (pumps, A/C units, etc), and some computer equipment are served at 480/277 volts via panel boards located throughout the building. The building receptacles, small motors, desktop computers, computer room equipment, and similar loads are served at 208/120 volts via step-down transformers and panel boards.

LARGO
The Largo facility receives its power from Potomac Electric and Power Company (PEPCO).

The Largo (ITC) facility has two power feeds. One of these feeds the existing 125kVA UPS and HVAC units and the other fills office/supplementary requirements. Each of these feeds is currently run through a separate Automatic Transfer Switch (ATS), which is connected to a single generator.

The facility manager recommends a separate power feed to the designated rooms, which can be sized as needed to meet the requirements. 150kVA would be available from the generator via separate ATS.

C.11.3.2 Cost of Electrical Utilities Based on Recent Billing

BLDR-1 & BLDR-2
Electrical utility costs for DSRC occupants are currently charged to building tenants according to finished square footage occupied. Based on this algorithm, the electrical cost was $3.14 per square foot in FY 2004. There is a real possibility of metering electrical usage in the future. In this case, electrical costs would increase substantially. In FY 2004, the average cost for power was $0.05/kWH.

PRTN
The following table shows usage and expenditure data for the entire Princeton Complex as an indicator of recent electrical utility costs.

Total Usage and Expenditures for Electrical Utilities of the Princeton Complex for FY 1999 - FY 2004

	Annual Usage (kWH)	Expenditure	Avg. Cost / kWH
FY 1999	8,826,400	$713,948	$0.0810
FY 2000	9,032,000	$640,544	$0.0707
FY 2001	8,555,200	$644,035	$0.0756
FY 2002	5,976,000	$431,506	$0.0722
FY 2003	6,593,600	$472,405	$0.0711
FY 2004	7,981,571	$654,619	$0.0820

Measurements taken from the two UPS systems in the Computer Room suggest that the power usage of the current HPCS is roughly 400 kVA. If we assume that the power required for cooling to support this system is conservatively estimated to be 1.2 times this power usage (accounting for other room heat sources and cooling system inefficiencies), this implies a total power usage for the system of around 880 kVA. Assuming this power usage is constant throughout the year implies an annual usage of roughly 6,500,000 kWH or roughly 82% of the total usage for the Princeton Complex.

FAIRMONT

The cost of electrical power has averaged $.05 per KWH over the past several years. How the amount of power consumed is calculated and how it is paid for is negotiable. As stated earlier, power and cooling requirements will have to be accommodated after the requirements are determined.

Total Usage and Expenditures for Electrical Utilities of the FAIRMONT IV&V Facility for FY 2000 - FY 2004

	Annual Usage (kWH)	Expenditure	Avg. Cost / kWH
FY 2000	3,705,600	$184,000	$.0497
FY 2001	3,625,345	$180,000	$.0497
FY 2002	6,554,355	$317,000	$.0484
FY 2003	4,853,702	$235,000	$.0484

LARGO

Based on a recent bill, the total for 14,400 KWH was $2,750.95, which includes Distribution Services, Generation Services, and Transmission Services. This suggests a combined rate of $0.19/KWH.

C.11.3.3 Power Conditioning and UPS Capabilities

BLDR-1

- Power Distribution: Cutler-Hammer Electrical Distribution Equipment (480Volt, 3 Phase) Under floor distribution is accomplished by 50 ft. flexible conduit power whips, fed from wall-mounted breaker panels.
- UPS: 300 kVA Chloride UPS Systems (450 kVA Installed); (250kVA available to R&D HPCS in 2006); 8-Minute Runtime (Full Load)
- Other: Transient Voltage Surge Suppressor (TVSS) Protected
- Emergency Power Off (EPO) Switch Protected

BLDR-2

- Power Distribution: Cutler-Hammer Electrical Distribution Equipment (480Volt, 3 Phase)
- Under floor power distribution will be accomplished by fixed receptacles attached to rigid conduit and mounted one foot below the floor tiles.
- UPS: 350 kVA UPS System (500 kVA Installed); 16-Minute Runtime (Full Load)
- Other: Transient Voltage Surge Suppressor (TVSS) Protected
- Emergency Power Off (EPO) Switch Protected

PRTN

- Power Distribution Units (PDUs) [shown in dark blue in Fig. 3]:
- Three (3) United Power 225-KVA PDUs (owned by Government/Princeton University)
- Liebert 125-KVA PDU (owned by Government/Princeton University)
- EPE 125-KVA PDU (owned by Government/Princeton University)
- UPS [shown in brown in Figure 3]:
- 500-kVA UPS MGE cabinet and battery bank (owned by Raytheon)
- 225-kVA UPS MGE cabinet and battery bank (owned by Government/Princeton University)

FAIRMONT

Currently Fairmont has two 1000 kVA UPS stations with associated battery banks to support a 30-minute runtime. Dependence on additional load requirements by the Contractor will determine how many additional PDU's and switch circuits will be available. Any additional requirements above the current capacity will the responsibility of the Contractor.

LARGO

The current UPS and PDU (MGE 75 KVA) are sized to support current operations and some expansion. Therefore, the Contractor must acquire a separate UPS and PDU for the HPC operation based on the probable power requirements.

C.11.3.4 Backup Power Generator Capabilities

BLDR-1

- All Equipment fully backed up by emergency backup generators.
- Current Generator is 1250-KW Cummins Diesel. 1800-gallon tank capacity allows 24 hours of operation

BLDR-2
The DSRC EM Generator has reached its rated capacity, and no further load will be allowed. Therefore, the BLDR-2 facility will not have EM generator backup. The UPS systems will be designed to sustain a 16-minute outage at full load. The recent power loss history at DSRC is presented in Section C.11.7.1 below.

PRTN
Natural-gas-fired, 75-kW generator: activates automatically when power is lost. This generator is only designed to allow pumps within the chilled-water cooling system to continue to run during a brief power outage.

FAIRMONT
The NASA IV&V Facility has two diesel-fired, 1250-kW each, generators that activate automatically when power is lost or disrupted.

LARGO
A new Natural Gas Generator is currently being installed. A separate power feed is present with its own Automatic Transfer Switch. This would be connected to the 250KW Natural Gas Generator that is being installed.

C.11.4 Cooling Facilities

C.11.4.1 Cooling Service to Building

BLDR-1 & BLDR-2
Building operates three (3) 470-ton chilled-water cooling systems. Two of the systems are on EM generator power, and one is fed strictly from utility. There are three cooling towers, each sized to match the capacity of a single chiller. There are three primary pumps, three secondary pumps, and three condenser water pumps. The chiller plant is located in a mechanical room that is adjacent to BLDR-2. Cooling is delivered at 42^{o}F. There is a rough-in plan for an additional chiller and space for an additional cooling tower in the future, but no plans have been authorized to expand the chiller plant at this time. The chiller plant is currently operating at full capacity.

PRTN
Primary Chilled Water Plant, located in the mechanical room and tower bay southeast of the Transformer Room (see Figure 4), contains two chillers:

- 400-ton Carrier centrifugal chiller (designated Chiller #1)
- 350-ton York centrifugal chiller (designated Chiller #3)
- Baltimore Air Coil Cooling Towers

Chiller #1 was installed in the spring of 2000 along with new cooling towers and pumps. Chiller #3 was installed in 1996.

Secondary Chilled Water Plant, located in the Transformer Room (see Figure 4):

- 225-ton Carrier centrifugal chiller (designated Chiller #4)
- Baltimore Air Coil Cooling Tower

Chiller #4 was installed in 1979. Cooling tower replacement will be completed by November 2004.

The Primary Chilled Water Plant provides cooling to the entire Princeton Complex. The Secondary Chilled Water Plant is designed to only support the Computer Building.

The current configuration permits operation of only one chiller in the Primary Chilled Water Plant at a time. The power capacity of the Main Building substation has been determined to permit operation of any two of the three chillers at one time. The issue of whether the two large chillers, Chiller #1 and #3, can be run simultaneously requires further study; however, indications are that they cannot, due to water flow constraints or flow control problems caused by the current chilled water piping design. In particular, Princeton University's experience indicates that Chiller #1 is very sensitive to small changes in flow; as a result, University personnel do not believe that they can operate Chiller #1 along with either of the other two chillers without modifying its flow sensitivity controls. These restrictions could be eliminated by a redesign of the chilled water plumbing and/or controls; until this situation is resolved, operation appears to be limited to Chillers #3 and #4 for heating loads requiring more than one chiller. The problem with this is that, in the event that Chiller #3 or #4 are unavailable, operation will be limited to only one chiller.

Because of past problems with the former cooling tower in the Secondary Chilled Water Plant, Chiller #4 has only been used on especially hot days for emergencies, or as backup to partially support the cooling load during periods of time when one of the primary chillers is taken off-line for servicing or repair. However, the former cooling tower for the Secondary Chilled Water Plant was replaced in 2004. Because of this enhancement, Chiller #4 is now expected to be capable of providing sustaining a more robust cooling load.

Cooling is delivered to the Computer Room through a six-inch and eight-inch piping system from the mechanical rooms at a temperature of 42^{o} F, plus or minus 2 degrees. The pipe enters the computer room in a trench that is 4 feet deep under the raised floor in the center of the computer room, as indicated in Figure 4. The piping to the Computer Building currently limits the flow of chilled water to the Computer Room and will require redesign if additional cooling capacity is required.

FAIRMONT

The NASA Facility operates three (3) 150-ton chilled-water cooling systems. All of the systems are on generator power. There are three cooling towers, each sized to match the capacity of a single chiller. There is 100% back up (one primary, one redundant) pumping capacity for the chilled water and condenser water systems. Cooling is delivered at 45^{o}F. However, additional cooling

capacity may be required to accommodate the system associated with this contract.

LARGO
The ITC has roof-mounted condensers, which feed the two existing HVAC units. There are three condenser/chiller units on the roof of the facility. The facility will be upgrading/replacing HVAC units in March 2005, and additional requirements could be handled in conjunction with those enhancements.

C.11.4.2 Room Air Conditioning Capabilities

BLDR-1

- 90-Ton Liebert Downdraft Computer Room Air Conditioners (CRACs) (De-rated for altitude) (120 Tons Installed via 4 x 30 Ton units)
- Cooling powered from Emergency circuits.

BLDR-2

- 90-Ton Liebert Downdraft CRAC (De-rated for altitude) (120 Tons Installed via 4 x 30 Ton units)
- Thirteen (13) 4-Ton Liebert Extreme Density Overhead (XDO) Systems
- Cooling powered from UPS

PRTN

- Seven (7) 35-ton Dataflow/APC CRACs (owned by the Government/ Princeton University)
- Other smaller air handling units - one located in the ceiling of the Printer Room and two in the UPS room

The primary source of humidification for the Computer Room is air-handlers and an electric steam boiler, located in the building tower on the western corner of the Computer Building.

FAIRMONT
The room leased by NOAA contains six (6) Environment Control Units (ECU) that provide the environmental control to the room. However, the current NOAA system occupying the room requires the current capability of all the ECUs. Additional cooling capability will have to be designed and engineered to accommodate the system associated with this contract.

LARGO
The facility has two air handlers. The two air handlers provide N+1 capacity**.** The two HVAC units are Dataguard CCT-DX Series units – total capacity unknown at this time. The units were originally sized to support a UNISYS 1100 Series mainframe and peripheral subsystems. The facility has experience with cooling all systems with a single unit with only one of three compressors operating.

C.11.4.3 Availability of Plumbing for Chilled Water

BLDR-1 & BLDR-2
All chilled water plumbing is installed to accommodate the Computer Room Air Conditioner (CRAC) units and the Extreme Density Overhead systems. No additional plumbing capability or capacity is available.

PRTN
The computer room has operated several water-cooled computer systems (most recently - Cray T932, T94, and T3E) and thus has been previously configured to support water-cooling, including a chilled-water trench running down the middle of the raised-floor area of the computer room, as indicated in Figure 4.

FAIRMONT
The facility's current chilled water system is running at capacity. Modifications will have to be engineered to accommodate additional requirements.

LARGO
The facility has plumbing that can be used to support water-cooled systems.

C.11.5 Networking Facilities

C.11.5.1 Wide-Area Networking Services to Computer Room

BLDR-1 & BLDR-2
NOAA Boulder maintains multiple wide-area networking links. These include a one-gigabit per second (1 Gb/sec) connection shared with NCAR from Boulder to the Denver Front Range GigaPoP (FRGP) via dark fiber. This link provides connections to the commercial Internet via AT&T, Cable & Wireless, and Level3 at 20 Mb/sec for each path. The NOAA/NCAR-FRGP link also provides a 310-Mb/sec connection to Internet2. In addition, NOAA Boulder maintains a secondary 20-Mb/sec connection to the commercial Internet through the University of Colorado (CU). CU also maintains a separate 622-Mb/sec link to the FRGP that is available to NOAA Boulder should the NCAR link fail.

Note: If the Contractor chooses to use both BLDR-1 and BLDR-2, any LAN connection between BLDR-1 and BLDR-2 must be made with fiber.

PRTN
PRTN maintains a 9 Mb/sec connection to the commercial Internet under its current Raytheon contract. In addition, the B-Site Forrestal Campus maintains a 100-Mb/sec microwave connection to the Main Campus of Princeton University. This connection provides access to Princeton University's 100 Mb/sec connection to Internet2.

FAIRMONT
Current network connections:

- Verizon OC-3 155 MB link to Camp Springs, MD
- Qwest OC-3 155 MB link to Gaithersburg, MD
- (on order) Qwest Gig-E link to Gaithersburg, MD

- (on order) Qwest Gig-E link to Camp Springs, MD

Note: As these circuits are utilized by NCEP for operational traffic, and are not available for other purposes. However, they are indicative of the telecommunications infrastructure associated with the Fairmont facility.

LARGO

Current network connections:

- Verizon Transparent LAN Service (TLS) -100MB link to the NOAA Silver Spring complex
- Verizon FDDI Network Service (FNS) -10MB link to the Washington area MAN
- 3Mbps WAN (IP over Frame Relay) connected to the four Administrative Support Centers (which are located in Norfolk, Kansas City, Boulder, and Seattle) and to the USDA National Finance Center

This facility is currently served by the earlier FNS 10 MBps and a TLS 100 MBps service. Both are part of the Metro area MAN and connect to Silver Spring and other DC area sites using either FNS or TLS.

C.11.5.2 Proximity to Additional Wide-Area Networking Capability

BLDR-1 & BLDR-2

NOAA Boulder is a joint owner of the Boulder Research and Administrative Network (BRAN). BRAN is an eleven-mile dark fiber metropolitan-area network owned by NOAA, UCAR/NCAR, CU, and the City and County of Boulder. Besides interconnecting BRAN owner sites, it also has key tactical access to commercial communication providers, US West and ICG. NOAA has indisputable access to 24 strands of BRAN fiber. NOAA Boulder and the FRGP have contracted with the National Lambda Rail (NLR) network to attach in fiscal year 2005. Using Dense Wavelength Division Multiplexing, NLR will provide multiple channels of service at startup including: a 10-Gigabit Ethernet routed circuit to Internet and Internet2, multiple one-Gigabit Ethernet switched circuits to NLR nodes, multiple wavelengths for dedicated point-to-point circuits, and service for the Global Lambda Integration Facility.

PRTN

Level3 maintains a dark-fiber run along U.S. Route 1, which is roughly 1/3 mile from the lab across the field. The B-Site of Forrestal Campus is connected to the DOE-supported Princeton Plasma Physics Laboratory (PPPL) through dark fiber. PPPL is on DOE's ESnet wide-area network with a bandwidth capacity of at least OC3.

FAIRMONT

The facility is located approximately 100 miles from the nearest GigaPop (at the Ohio Supercomputing Center in Pittsburgh).

LARGO
In 2002 the Government investigated the possibility of upgrading the communications resources at the Largo facility. The approximate cost to install a two-pair “dark” fiber link to the University of Maryland Gigapop was estimated by FiberGate to be roughly $80,000 for installation. (FiberGate currently has runs along Landover Road - Route 202, which is 1/2 mile from the ITC.) The monthly recurring maintenance charge does increase, though not in a linear fashion. One pair was estimated at $1500/month and the second pair raised the cost to $2500/month. At this time there are no budgeted funds allocated to implement this upgrade.

Verizon provides network service to this area.

C.11.6 Fire Alarm and Fire Suppression Capabilities

C.11.6.1 Fire Alarm and Suppression Systems

BLDR-1 & BLDR-2
Both computer rooms will have FM-200 fire suppression with VESDA fire detection systems. Both will have wet-pipe overhead sprinklers with 155^{o}F trip point. CO_2 bottles are located in the room with FE-36 bottles surrounding the room. Alarms are tied to the building alarm system.

PRTN
The PRTN computer room currently is protected by a high-voltage fire alarm system and a wet-pipe water sprinkler system. However, this coming winter/spring, these systems will be replaced with the following: (1) a low-voltage alarm system with advanced alarm panel in the room adjacent to the computer room, (2) a dry-pipe water sprinkler system, (3) plumbing and other infrastructure to support future use of a gaseous fire suppression system (such as FM-200), and (4) a VESDA early smoke detection system.

FAIRMONT
The computer room is protected by a fire alarm system and a pre-action water sprinkler system.

LARGO
The Largo computer room is protected by a fire alarm system and a wet-pipe water sprinkler system.

C.11.6.2 Fire Extinguishers

BLDR-1 & BLDR-2
Fire extinguishers located within the computer rooms are CO_2 bottles. Fire extinguishers located within the hallways and computer room access areas are FE-36 gas bottles.

PRTN
Following the NCEP fire event in 2000, PRTN reviewed its fire procedures and eliminated any dry-chemical fire extinguishers from the entry paths to the Computer Room. The lab also met with the supporting fire departments, both Plainsboro and Princeton Plasma Physics Laboratory (PPPL) fire units, to explain the dangers of dry chemical extinguishers to computer equipment and to verify fire suppression procedures to be followed during fire emergencies.

FAIRMONT
Fire extinguishers are located within the computer rooms and throughout the facility. The fire extinguishers located within the computer room are designed for use with electronic equipment.

LARGO
Fire extinguishers are located within the computer rooms and throughout the facility. The fire extinguishers located within the computer room are designed for use with electronic equipment.

C.11.6.3 Response Time of Local Fire Department

Response time is defined as the time duration between fire alarm activation and the arrival of fire department personnel and equipment at the site.

BLDR-1 & BLDR-2
Boulder Fire Department provides fire-fighting capability. A station is located approximately one mile away and the response time is between 4 to 6 minutes.

PRTN
The Princeton Complex has measured the response time of the fire department (Plainsboro Fire Department as first responders, backed up by Princeton Plasma Physics Lab) to average 10 minutes (minimum of 7 minutes and maximum of 14 minutes), based on 6 events (2002-2004). These events were caused by unrehearsed false alarm events that were caused by faulty alarm sensors. [The Princeton Complex will be replacing the entire fire alarm system during the winter of 2004-05.]

FAIRMONT
THE NASA IV&V Facility is supported by the Fairmont Fire Department. The average response time is approximately 7 minutes. Each year the members of the fire department are given a tour of the facility to keep them familiar with the facility and to keep them informed of what is within the facility.

LARGO
In the most recent incident the local fire department arrived on scene within 10-15 minutes of being notified. The closest fire department, Kentland Volunteer Fire Department, is located less than five miles from the facility.

C.11.7 Special Capabilities

C.11.7.1 Capabilities for Continuous Operation

The following describes any capability that the facility may have to permit continued operation during a power outage or to ride through power anomalies.

BLDR-1

All electrical systems are fully backed up for uninterrupted service to cover for any length of power outage. The CRAC units are powered from emergency circuits, and will experience a shutdown until the EM generator comes online and transfers power (usually one to two minutes.) at which time they will automatically and sequentially restart. Once the EM generator starts, it will continue to operate until clean and stable utility power is maintained for 30 minutes, at which time the generator will transfer the load back to utility power and shut down.

BLDR-2

No EM generator capacity is available for this facility; therefore, all equipment will be placed on to UPS power fed from utility. Should a lengthy outage occur, the UPS would provide uninterrupted service, until which time a graceful shutdown of computer equipment is required. CRAC units and cooling systems will remain on until all equipment is off and all static air has been forced from the compute nodes. The CRAC units will then shutdown, prior to exhausting the battery capability of the UPS systems.

The DSRC outage history is in the following table and shows one outage per year that would mandate a shutdown of the computer room.

Recent History of Power Loss Episodes at DSRC

FY2003		
DATE	**DURATION**	**Resulting Downtime**
26 Mar 03	13 Minutes	0 Min
13 May 03	13 Minutes	0 Min
8 Sep 03	30 Seconds	0 Min
11 Sep 03	2 Minutes	0 Min
FY2004		
10 Jun 04	52 Minutes	0 Min

PRTN

PRTN's facility environment is designed primarily for riding through a brief power outage, assuming the outage is sufficiently brief that the chillers will be able to automatically restart so that the temperature and humidity conditions in the computer room are maintained within acceptable limits.

The following table indicates environment related outages for the last three fiscal years. During these years, there were 29 documented power fluctuation episodes (14 in FY02, 11 in FY03, and 4 in FY04) in which the UPSs and PDUs

maintained conditioned power to the computer systems and the chillers either continued to operate or else shutdown and then restarted automatically.

Recent History of Environment-Related Outages for PRTN

FY2002	
23 Jul 02	Mechanical (chiller) outage of 53-minute duration with 36 minutes of system recovery time
FY2003	
25 Feb 04	Power outage of 103-minute duration with 224 minutes of system recovery time
FY2004	
	No outages

FAIRMONT
All critical electrical systems are fully backed up for uninterrupted service to cover for an extended length of power outage. The facility's operational systems are protected by UPS systems that are supported by a bank of batteries and two diesel generators. Although the diesel generators come on line automatically within one minute if a power loss or disruption is detected, the battery system will provide uninterrupted power for up to 30 minutes.

LARGO
A new natural gas generator is currently being installed. There have been five power outages in CY 2004. Three of these were less than one hour in duration.

C.11.7.2 Duration of Ride-Through at Full Load

BLDR-1
Not Applicable – Maintain operation during power outage

BLDR-2
Designed for graceful shutdown during a power outage lasting longer than 10 minutes, with CRAC units shutting down last.

PRTN
The UPS systems for the current system provide a ride-through for the computer systems of 30 minutes on the 500-KVA UPS and 60 minutes on the 225-KVA UPS. However, the room air conditioning units and the chillers do not have generator support. If the power interruption is brief, Chillers #1 and 3 are likely to restart automatically. This recycling capability, combined with generator backup for the chilled water pumps, permits the facility to ride through brief power interruptions without the system going down.

FAIRMONT
The NASA IV&V Facility is designed to provide uninterrupted power to all current critical operational systems.

LARGO
There is no UPS associated with the proposed facilities.

C.11.7.3 Capabilities for Remote Facility Management

The following describes any capability that allows the facility to be monitored and managed remotely.

BLDR-1 & BLDR-2
BLDR-1 has SCADA (Supervisory Control and Data Acquisition) coverage for environmental monitoring. BLDR-2 is projected to have SCADA coverage as well. CRAC units also have building automation tie-in for alarms. Both systems have dial-out capability.

PRTN
Currently the computer room does not have remote monitoring capabilities. Such capabilities are being investigated for possible future implementation.

FAIRMONT
The Fairmont center currently has remote dial-up capability, and is expecting an upgrade to have full remote monitoring capability within the next six months.

LARGO
The computer room does not have remote monitoring capabilities.

C.11.7.4 Capabilities for Lights-Out Operation

The following describes any capability that allows the facility to operate during off-hours without operators present.

BLDR-1 & BLDR-2
BLDR-1 currently has no operator coverage from 7pm to 7am every day. The SCADA environmental monitoring system will trigger an automated Emergency Power Off (EPO) if the temperature reaches 94oF.

PRTN
Currently the Computer Room does not have remote monitoring capabilities. Such capabilities are being investigated for possible future implementation.

FAIRMONT
The NASA IV&V Facility is typically a Monday – Friday, 7:00 AM – 6:00 PM operation, but Security personnel are present 24/7/365; therefore, after-hours access is available.

LARGO
The facility at Largo is manned round-the-clock on every day of the year.

C.11.8 Physical Security

C.11.8.1 Campus Security

BLDR-1 & BLDR-2
Both facilities are located on federal property with federal police providing access to the grounds round the clock.

PRTN
Security personnel patrol the Forrestal Campus on a regular basis.

FAIRMONT
NASA security personnel are located on site 24/7/365.

LARGO
Federal Protective Service patrols on a regular basis.

C.11.8.2 Computer Room Security

BLDR-1 & BLDR-2
Computer room has restricted access provided by cipher locks and other controls.

PRTN
Computer Room access is controlled by a cipher lock system and other controls.

FAIRMONT
The computer room has restricted access provided by proximity badge readers and other controls. Because the facility is used by a government organization, access to the facility is controlled by NASA per NASA regulations.

LARGO
The computer room has restricted access provided by proximity badge readers and other controls.

C.11.8.3 Procedures for Contract Personnel to Access a Government Facility

BLDR-1 & BLDR-2 & PRTN & FAIRMONT & LARGO
All contract personnel must submit to a background check and will be issued an "affiliate" ID badge. Authorized NOAA and contractor personnel may escort other NOAA and contractor personnel as long as the visitors are US citizens. Special arrangements must be made weeks in advance to accommodate escorted access by foreign nationals.

FAIRMONT
Access to the NOAA room is authorized by NOAA but controlled by NASA IV&V Facility Security personnel and systems. Authorized NOAA and contractor personnel may escort other NOAA and contractor personnel into the NOAA area

as long as they are US citizens. Special arrangements must be made weeks in advance to accommodate escorted access by foreign nationals.

C.11.9 Estimated Annual Facility Cost of Operation of Computer Room (Excluding Power Costs)

BLDR-1 & BLDR-2
Annual costs for rent, maintenance, heating, and other general services were $42.25/sq. ft. in FY 2004 as paid to the building landlord, GSA.

PRTN
Annual facility costs, excluding electrical utility costs, are estimated to be $10/sq. ft. This includes: rent paid to Princeton under the Government triple-net lease; facilities services (physical plant maintenance, equipment service, janitorial services, etc.); utilities (other than electrical power); and wide-area network fees.

FAIRMONT
Annual facility costs are approximately $54 per sq. ft. per year, which includes the following: most utility costs (but not the mass consumption of electricity); some ADP support; security; and facility support, such as cleaning, mail delivery, etc. Mass electrical usage is calculated and charged separately at approximately $.05 per kWH.

LARGO
Annual facility costs, excluding electrical utility costs, are estimated to be $28/sq. ft. This covers the entire facility cost, including water and electrical power, with the addition of a charge of approximate $45K/year for after normal business hours and weekend power.. The ITC facility is 16,250 sq. ft., of which 15,950 are usable (water heater, etc. makes up the difference).

C.11.10 Availability of Blueprints

BLDR-1 & BLDR-2 & PRTN & FAIRMONT & LARGO
Blueprints of the facility are available and will be provided to Offerors, subject to their approval of conditions for their use of the drawings.

C.11.11 Projected Availability of Floor Space, Power, Cooling, and WAN Bandwidth

The following amounts show projected total resources available at the indicated dates under the assumptions provided. The October 2004 availability is shown for reference purposes only, since Contractors cannot utilize the resources until October 2005.

		Oct. 2004	Oct. 2005	Oct. 2006
Available Raised Floor Space (sq. ft.)				
	BLDR	0	1,500	3,750
	PRTN	1,900	2,700	5,500
	FAIRMONT	3,200	3,200	3,200
	LARGO	1,080	1,080	1,080
	TOTAL	***6,180***	***8,480***	***13,530***
Available Non-Raised Floor Space (sq.ft.)				
	BLDR	0	0	0
	PRTN	360	360	360
	FAIRMONT	0	0	0
	LARGO	724	864/1,440	864/1,440
	TOTAL	***1,084***	***1,224/1,800***	***1,224/1,800***
Available Power for New Hardware (kVA)				
	BLDR	0	350	600
	PRTN	250	150	575
	FAIRMONT	150	150	150
	LARGO	***0***	150	150
	TOTAL	***400***	***800***	***1,475***

		Oct. 2004	Oct. 2005	Oct. 2006
Available Cooling for New Hardware (tons)				
	BLDR	0	146	218
	PRTN	180	155	283
	FAIRMONT	0	0	0
	LARGO	0	*	*
	TOTAL	***6,180***	***8,480***	***13,530***
*NOTE: The available cooling specs for the Largo facility will be provided to Offerors during the scheduled site visit.				

Assumptions for Projections

Available Raised Floor Space:

BLDR:

(1) October 2005 estimate of 1500 sq. ft. is solely in BLDR-2 and assumes completion of computer room design, construction and testing.

(2) The increase of 2250 sq. ft. in the October 2006 total reflects additional available space in BLDR-1 that is currentlyoccupied by systems purchased under current HPTi contract. In reality, the new Contractor will be required to coordinate new equipment installation with current system removal so as to minimize loss of compute cycles to the Government.

PRTN:

(1) Oct. 2004 estimate assumes StorageTek silos have been moved onto non-raised floor as indicated in Fig. 3.

(2) Oct. 2005 estimate assumes the mid-contract upgrade under the current Raytheon contract will provide 20% of additional free raised floor space compared to current floor-space usage.

(3) Oct. 2006 estimate reflects available space occupied by systems leased under current Raytheon contract. In reality, the new contractor will be required to coordinate new equipment installation with current system removal so as to minimize loss of compute cycles to the Government.

FAIRMONT:

The available space in the Fairmont facility is available for use in July 2006.

LARGO:
The available space in the Largo facility is available for use in March 2005.

Available Power:

BLDR:
(1.) The projected available power is dictated by the cooling capacity that is available. Currently, the chilled water plant has reached its rated capacity and no further load can be supported without the addition of a new chiller.

PRTN:
(1.) The projected available power assumes, somewhat arbitrarily, that total power to the computer room is limited to the current UPS capacities, which total 725 kVA, reduced by a 10% safety factor to roughly 650 kVA. This is a conservative estimate, given the total substation capacity, but does not include usage of chillers, which are currently run off the Main Building substation.
(2.) Power estimates assume steady state ratings, not book value ratings for systems.
(3.) Oct. 2005 estimate assumes a 25% increase in power usage over current usage.
(4.) As with floor space, the Oct. 2006 reflects only minimal system usage from the current system with a background usage of 75 kVA.

FAIRMONT:
It is the assumption that NOAA and NASA will have to make modifications to the facility to meet the power requirements and could be available within 6 months of the requirements being established. Studies are being performed now to determine alternate approaches.

LARGO:
The Government requires that the Contractor acquire a separate UPS and PDU to support any HPC components that are placed in the LARGO facility.

Available Cooling:

BLDR:
(1.) The chilled water plant has reached its maximum capacity and will lose its N+1 capability on hot days. A failure within the chilled water plant, on a hot day, will force the BLDR-2 computer room to load shed its cooling resources and shut down.

PRTN:
(1.) Assume the building load for the Princeton Complex for the hottest day of the year is 274 tons, based on observation that Chiller #1 alone (400 tons) will reach maximum capacity on this day when cooling the Princeton Complex plus the current system.
(2.) Compute cooling load for the system by multiplying system power usage (converted to tons) by a factor of 1.2 to reflect (conservatively) other room heat sources and cooling inefficiencies.
(3.) Assume maximum chiller capacity uses chillers #3 (350 tons) and #4 (225 tons) operating together. Joint operation of chillers #1 (400 tons) and #4 (225 tons) are not currently viable as explained in Section C.11.4. However, as indicated in Section C.11.4, joint operation of chillers #1 and #3 is expected to require mechanical (plumbing) modifications.

FAIRMONT:
The chilled water plant has reached its maximum capacity. It is the assumption that NOAA and NASA will have to make modifications to the facility to meet the cooling requirements and could be available within one year of the requirements being established. Studies are being performed now to determine alternate approaches.

LARGO:
The assumption is that the facility has adequate cooling available. However, this is dependent on the size and type of equipment that the contractor may chose to place at this facility.

		Oct. 2004	Oct. 2005	Oct. 2006
Available Wide-Area Network Capacity (Mb/sec.) (list by type below)				
	BLDR			
Abilene / Internet 2		310	500	0
Commercial Internet		80	80	100
National Lambda Rail (NLR)				
NOAA Research / Internet 2		0	1,000	10,000
Commercial Internet		0	1,000	1,000
***Note: 10,000 Mbps and/or dedicated Lambda's (wavelengths) may be available via NLR in 2005 And 2006 if needed.**				
	PRTN			
Microwave to Internet2 (PU allowed)= 50 Mb/s		25	20	15
Commercial Internet = 9 Mb/s		3	3	3
	FAIRMONT			
No Government-furnished WAN capacity available		0	0	0
	LARGO			
Verizon Transparent LAN Service		100	100	100
	TOTAL	***515***	***2,700***	***11,215***

Assumptions for Projections

Available Wide-Area Network Capacity:

BLDR:
(1.) WAN capacity assumes timely completion of National Lambda Rail installation and connectivity

PRTN:
(1.) Assume Princeton University only permits NOAA to use a total of 50% of its Internet2 bandwidth capacity.
(2.) Assume current NOAA usage of total bandwidth will grow at a rate of 15% per year.

FAIRMONT:
There is no government-furnished WAN capacity available for the contract. Therefore, the Offeror will need to provide any WAN capacity required for the contract.

LARGO:
The WAN capacity might need to be upgraded depending on the HPC components that are placed in this facility.

[Figure 1 withheld from Public Website – Available upon request.]

Figure 1 *Projected Computer Room Layout for BLDR-1 in September 2006. The area enclosed within the dashed line indicates the floor space that will be available for Offeror use in October 2006. The small squares shown indicate 2'x2' floor tiles. Vent tiles are indicated by stippled squares.*

[Figure 2 withheld from Public Website – Available upon request.]

Figure 2 *Schematic of Computer Room Layout for BLDR-2 facility that is expected to be available in October 2005*

[Figure 3 withheld from Public Website – Available upon request.]

Figure 3 *Computer Room Layout for PRTN as of January 2005. Small squares in the figure indicate 2'x2' floor tiles. Vent tiles are indicated by stippled squares.*

[Figure 4 withheld from Public Website – Available upon request.]

Figure 4 *Computer Building Schematic for Princeton Complex*

[Figure 5 withheld from Public Website – Available upon request.]

Figure 5 *Schematic of Computer Rooms for LARGO*

[Figure 6 withheld from Public Website – Available upon request.]

Figure 6 *Schematic of Computer Room for FAIRMONT*

Request for these figures are to be submitted to the Contracting Officer at the following e-mail address: william.voitk@noaa.gov

C.12 Appendix C – Government Furnished Equipment (GFE)

The following describes Government-owned property that is available to be furnished to the Contractor for the performance of this contract. Because some Government-furnished equipment that is located at the designated sites is only available for use by the Contractor if that facility is used, the GFE lists are separated into two categories: "Site-Constrained GFE", which is equipment that is only available if used at the designated site; and "Unrestricted GFE", which is available for use under this solicitation without site restrictions.

Boulder, CO

Site-Constrained GFE

Note: Partial use of this equipment is authorized up to the limits set forth in Appendix B.

Manufacturer	Part/Model Number	Description	Qty	Date Available
Chloride	EDP90/300/250 4x4	Uninterruptible Power Supply UPS Cabinet and Battery Bank (250kVA)	1	10/2006
	EDP70L/100/100 4x4	UPS Cabinet and Battery Bank (100kVA)	2	10/2006
Liebert	FH740C	Computer Room Air Conditioning Chill Water - Down Draft – 30 tons	4	10/2006
Phonetics	SCADA 3000	Environmental Monitoring Sensaphone SCADA 3000	1	10/2006

Unrestricted GFE

Manufacturer	Part/ Model Number	Description	Qty	Date Available
		Compute Hardware		
Myricom	M3-E128	Myrinet line card enclosure	15	10/2006
Myricom	M3-M	Management line card	15	10/2006
Myricom	M3-SW16-4DM	Ribbon spine line card	84	10/2006
Myricom	M3-SPINE-8F	Fiber spine line card	44	10/2006
Myricom	M3-SW16-8F	Fiber switch line card	96	10/2006
Myricom	M3F-PCI64B-2	PCI card (NIC)	768	10/2006
Myricom	M3-CLOS-ENCL	14U enclosure for Clos256_256 networks	2	10/2006
Myricom	M3F-PCIXD-2	PCI D card (NIC)	317	10/2006
Myricom	M3-SW32-16F	16 Port line card	20	10/2006
Myricom	M3-THRU-16Q	Line card for 16 quad fiber thru connections	2	10/2006
Myricom	M3-2SW32	Dual SW32 line card	4	10/2006
Myricom	M3-4SW32-16Q	Quad SW32 line card	2	10/2006
		HSMS		

Manufacturer	Part/ Model Number	Description	Qty	Date Available
ADIC	AML/J	Tape Robot	1	10/2006
IBM		LTO-1 Tape drives	8	10/2006
Sun	E450	HSMS Server	1	10/2006

Washington, DC

Site-Constrained GFE

- None

Unrestricted GFE

Gaithersburg, MD:
Two (2) StorageTek Powderhorn silos configuration (two 9310, 9311, 9330).
Each of the silos includes:

- eight (8) 9940B tape transports
- 5000 9940 tape cartridges

Each silo contains roughly one PetaByte of data.

Fairmont, WV:
One (1) StorageTek Powderhorn silo configuration (9310, 9311, 9330).
The silo includes:

- four (4) 9940B tape transports
- 2300 tape 9940 cartridges

Princeton, NJ

Site-Constrained GFE

Manufacturer	Part Number	Description	Qty
		Computer Room Security Monitoring	
		C-Cure 800	
Compac	4403US	Compac MS 2000 C-Cure 800 OS	1
Emerson	P761VBT0EENC	Monitor C-Cure 800	1
		Computer Room Security Monitoring	
		Intellex 16000	
Sensormatic	DVMS DV16000	Intellex 16000 Video recorder system w/CD backup max 16 cameras	1
NEC	FE1250+BK	Monitor Intellex 16000	1
Pelco	CC-3700-S	Color CCD Camera	12
		Power Distribution Units	
United Power	PDM4-F3-225-K13-426	PDU 1 (225 kVA)	1

United Power	PDM4-F3-225-K13-426	PDU 2 (225 kVA)	1
United Power	PDM4-F3-225-K13-426	PDU 3 (225 kVA)	1
		Uninterruptible Power Supply	
MGE	72-131522-000	UPS Cabinet and Battery Bank 225 KVA	1
		Power Distribution Units	
Liebert	PPA125C	PDU Unit (125 KVA)	1
EPE	PD084M48A12-125	PDU Unit (125 KVA)	1
		Computer Room Air Conditioners	
DataFlow	CCT-60C4	CRAC 1 (35 Tons)	1
DataFlow	CCT-60C4	CRAC 2 (35 Tons)	1
DataFlow	CCT-60C4	CRAC 3 (35 Tons)	1
DataFlow	CCT-60C4	CRAC 4 (35 Tons)	1
DataFlow	CCT-60C4	CRAC 5 (35 Tons)	1
DataFlow	CCT-60C4	CRAC 7 (35 Tons)	1
APC	CCT-60C4	CRAC 8 (35 Tons)	1
APC	CM-3.0-W-BC-D	CRAC 6 (3 Ton)	1

Unrestricted GFE

Manufacturer	Part Number	Description	Qty
		Switch for Shared Storage	
SGI	FC-SWITCH-16	SGI Fibre Channel switch with 16 ports and one power supply	8
SGI	FC-SWITCH-PWR	Optional second power supply for SGI FC switches (8 & 16 port)	8
SGI	FC-SWKIT	Rackmount kit for mounting FC-SWITCH-8 or FC_SWITCH-16 in F1RACK	8
SGI	XSWOPTGBIC	Short Wave Optical GBIC kit containing 6 GBICs	16
SGI	XCOPGBIC	Copper GBIC kit containing 6 GBICs	6
		Switch for Tape Drives	
SGI	FC-SWITCH-16	SGI Fibre Channel switch with 16 ports and one power supply	8
SGI	FC-SWITCH-PWR	Optional second power supply for SGI FC switches (8 & 16 port)	8
SGI	FC-SWKIT	Rackmount kit for mounting FC-SWITCH-8 or FC_SWITCH-16 in F1RACK	8
SGI	XSWOPTGBIC	Short Wave Optical GBIC kit containing 6 GBICs	16

SGI	XCOPGBIC	Copper GBIC kit containing 6 GBICs	6
		Console and Monitoring	
SGI	SG230-00008	230L Workstation, 667 MHz PIII, 128MB PC 133 SDRAM, 20GB IDE, V3 Gfx 32MB DDR, Red Hat 6.1	2
SGI	91-AB945-001	19" Northern Hemisphere Monitor	2
SGI	91-AD001-001	Keyboard, Mouse, Speakers, Power Cords, Monitor Cable, User Manual	2
SGI	SSU60003	HW on-site support 4hr rsponse, 7x24, years 1-3 for SGI 230 Workstation	2
SGI	SC4-PCP-2.0	Performance Co-Pilot - Performance Monitoring tool for IRIX 5.3 and higher (replaces PCPORIGIN)	1
SGI	SC4-PCPHPC-1.0	Performance C-Pilot Add-On agent for IRIX 6.5 clusters (replaces SC4-PCPARRAY-1.0); requires SC4-PCP-2.0	8
SGI	SV4-PCPCOL-2.0-10	Performance Co-Pilot Collector 10 license pack	1
		Hierarchical Storage Mgmt System	
SGI	ORIGIN-3800	SGI Origin 3800 server - 64 CPUs (GFE) 600Mhz R14000A processors), 64GB memory, 16 Local Disk Channels (1Gb/sec), 16 Shared Disk Channels(2Gb/sec), 24 Tape I/O Channels, and 2 Gigabit Ethernet Channels. 180GB	1
StorageTek	9310002-0000	POWDERHORN 6000 CART/450 EPH	3
StorageTek	9940L03-0000	9940, Library, Fibre	24
StorageTek	9840L03-0000	9840, Library, Fibre	22
SGI	FC-SWITCH-16	16 port 1Gb FC switch (8Cu/8Optical)	12
SGI	ORIGIN-3800	SGI Origin 3800 server - 64 CPUs (Lease 1a) 600Mhz R14000A processors), 64GB memory, 16 Local Disk Channels (1Gb/sec), 16 Shared Disk Channels(2Gb/sec), 24 Tape I/O Channels, and 2 Gigabit Ethernet Channels.	1
	Storage		
		HSMS Local Storage	
	SGI TP9100 1GB	TP9100 D-Brick with fourteen 36GB 10KRPM Drives	16
	STOR-CTRL 128	TP9100A Dual Channel Control Unit with 1Gb FC	16
	SGI TP9100 1GB	TP9100 D-Brick with fourteen 18GB 10KRPM Drives	2
	STOR-CTRL 128	TP9100A Dual Channel Control Unit with 1Gb FC	2
	Empty Rack	I/O Racks with AC Power Distribution	3

	FC-SWITCH-16	16 port 1Gb FC switch (8Cu/8Optical)	4

Hierarchical Storage Mgmt System

StorageTek	9310002-0000	POWDERHORN 6000 CART/450 EPH	1
StorageTek	9840	Media Cartridges	3000
StorageTek	9940	Media Cartridges	12000

Connectivity

Connectivity - Existing

Cisco	WS-C6509	Catalyst 6509 Chassis	1
Cisco	WS-CAC-1300W	Catalyst 6000 1300W AC Power Supply	1
Cisco	WS-CAC-1300W/2	Catalyst 6000 Second 1300W AC Power Supply	1
Cisco	SFC5K-SUP-5.5.1	Catalyst 6K Supervisor Flash Image, Release 5.5(1)	1
Cisco	WS-X6K-SUP1A-2GE	Catalyst 6000 Supervisor Engine 1A, Enhanced QoS, 2GE	2
Cisco	WS-X6416-GE-MT	Catalyst 56000 16-port Gig-Ethernet mod. MT-RJ	2
Cisco	WS-X6408A-GBIC	Catalyst 6000 8-port GE, Enhanced QoS	2
Cisco	WS-X6348-RJ-45	Catalyst 6000 48-port 10/100, Upgradable to Voice	2
Cisco	WS-G5486	1000BASE-LX/LH "long haul" GBIC	4
Cisco	WS-G5484	1000BASE-SX 'Short Wavelength' GBIC (Multimode only)	36
Cisco	CISCO3640	Cisco 3600 4-slot Modular Router-AC with IP software	2
Cisco	S364C-12.0.4T	IP	2
Cisco	NM-2CT1-CSU	2-Port Channelized T1/ISDN-PRI with CSU Network Module	2
Cisco	NM-1FE1CT1-CSU	1 Port F Ethernet 1 Port Channelized T1/ISDN-PRI with CSU NM	2

C.13 Appendix D – Terms

C.13.1 Abbreviations

ADIC	Advanced Digital Information Corporation
ANSI	American National Standards Institute
CM	Configuration Management
CM2	GFDL's Climate Model Version 2
CONOPS	DOC's Concept of Operations acquisition process
COTS	Commercial Off-The-Shelf
CXFS	SGI's shared filesystem for storage area networks (SANs)
DDN	Direct Data Networks
dGB	Decimal Gigabyte (10^9 bytes)
dPB	Decimal Petabyte (10^15 bytes)
DOC	US Department of Commerce http://www.commerce.gov
DSRC	David Skaggs Research Center
ENTA	Enterprise Network Target Architecture
FC	Fiber Channel
FISMA	Federal Information Security Management Act of 2002
FSL	NOAA's Forecast Systems Laboratory http://www.fsl.noaa.gov 325 Broadway Boulder, CO 80305
FY20xx	Fiscal Year 20xx
Gb	Gigabit (2^30 bits)
Gb/s	Gigabit(s) per second
GB	Gigabyte (2^30 bytes)
GFDL	NOAA's Geophysical Fluid Dynamics Laboratory http://www.gfdl.noaa.gov Princeton University Forrestal Campus 201 Forrestal Road Princeton, NJ 08542
GFE	Government Furnished Equipment
GNU	Unix-compatible software system
GPFS	General Parallel File System
GrADS	Grid Analysis and Display System
GSA	General Services Administration
HBA	Host Bus Adapter
HFS	Home File System
HIMF	Hallberg Isopycnal Model (Fortran)
HPC	High Performance Computing
HPCS	High Performance Computing System (see definition)
HPSS	High Performance Storage System

HSI	Hierarchical Storage Interface
HSM	Hierarchical Storage Management
HSMS	Hierarchical Storage Management System
htar	HPSS tape archiver
IDL	Interactive Data Language
IEEE	Institute of Electrical and Electronics Engineers
IMSL	International Mathematical and Statistical Library
I/O	Input/Output
IPCC	Intergovernmental Panel on Climate Change
IT	Information Technology
ITS	Information Technology Services
KB	Kilobyte (2^10 bytes)
KVA	Kilovolt amperes (1000-volt amps).
LAN	Local Area Network
LPAR	Logical Partitioning
LSC	Large-Scale Computing
LTD	Live Test Demonstration
MAN	Metropolitan Area Network
Mb	Megabit (2^20 bits)
Mb/s	Megabit(s) per second
MB	Megabyte (2^20 bytes)
MPI-2	Message Passing Interface (latest version)
MTBF	Mean-Time-Between-Failure
NAG	Numerical Algorithms Group
NCAR	National Center for Atmospheric Research
NCEP	NOAA's National Centers for Environmental Prediction http://www.ncep.noaa.gov 5200 Auth Road Camp Spring, MD 20746
NetCDF	Network Common Data Format
NIST	National Institute of Standards and Technology
NLR	National Lambda Rail
NOAA	DOC's National Oceanic and Atmospheric Administration http://www.noaa.gov
NWS	National Weather Service
OAR	Office of Oceanic and Atmospheric Research
OCIO	Office of the Chief Information Officer
OMB	Office of Management and Budget
OPM	Office of Personnel Management
PB	Petabyte (2^50 bytes)
PDU	power distribution units
PFTP	Program to transfer data from host to host
PM	Preventive Maintenance
POSIX	Portable Operating System Interface
PSE&G	Public Service Electric and Gas

R&D	Research and Development
RAID	Redundant Arrays of Inexpensive Disks
RFI	Request For Information
RFP	Request For Proposal
RUC	Rapid Update Cycle
SAN	Storage Area Network
SGE	Sun Grid Engine
SLT	System Life Throughput
SON	Statement of Need (Section C of this Procurement)
STK	Storage Technology
TB	Terabyte (2^40 bytes)
UDUNITS	Unidata's Units Library
UPS	Uninterruptible power supplies
WAN	Wide Area Network
WRF	Weather and Research Forecast
WRF-CHEM	Weather and Research Forecast with Atmospheric Chemistry
WRF-SI	Weather and Research Forecast with Static Initialization
WS	Workstream

C.13.2 Definitions

Application Memory	The maximum resident set size used by an application process in Mega/GigaBytes.
Availability	The availability level of a computer, component, or device is a percentage figure determined by dividing the operational use time by the difference between wallclock and null time.
Communication Fabric	The hardware component(s) supporting MPI message traffic.
Community Supported Software	Open Source Software
Degraded Mode	System operation at less than normal capability due to the loss of hardware or software components on that system.
Downtime	That period of time when all of an HPCS component's workload cannot be accomplished due to a malfunction in the Contractor-maintained HPCS hardware or software, or when the HPCS or a component of the HPCS is released to the Contractor for maintenance. See Section C.6.1.1.
HPCS	A High Performance Computing System can be one large System or an aggregation of Subsystems. A given System/Subsystem can be further described by individual components. A single component may span multiple Subsystems.
Job Slot	The logical partition of a computational resource supporting an instance of a workstream (e.g. the set of processing elements on which an instance of a workstream is run).

Null Time	The period of time when the workload cannot be accomplished due to environmental failure at a Government furnished Site, such as loss of electric power or cooling, or recovery from environmental failure.
Operational Use Time	The time during which equipment is available to the Government, exclusive of preventative maintenance time, remedial maintenance time, or Contractor-caused machine failure. Partial credit may be given by the Government for equipment operating in degraded mode (for example, when a portion of the processors, memory, disk, etc. on a computer is unavailable). The Government may declare the entire HPCS down even if parts of the HPCS are available.
Physical Memory per Processor Core	The size of the memory chipset in Mega/GigaBytes supporting a single processor core.
Preventative Maintenance (PM)	That maintenance performed by the Contractor which is designed to keep the equipment in proper operating condition. It is performed on a scheduled basis.
Processor Core	The component of the processor containing the dependently scheduled floating point and integer registers and arithmetic and load/store unit(s).
Processor Socket	The motherboard component designed to receive the processor.
Remedial Maintenance (RM)	That maintenance performed by the Contractor which results from Contractor-supplied equipment or operating software failure. It is performed as required and therefore on an unscheduled basis.
Suite	A set of concurrent instances of a workstream and possibly, a number of given workstreams (see target IT architecture).
Subsystem	The set of components which accomplish a workstream suite. The aggregate of all Subsystems is the HPCS. Synonym for Target IT Architecture.
System Life Throughput (SLT)	A measure of performance and availability delivered for all instances of a given workstream. See Section C.6.1.2 for more information.
Target IT Architecture	The set of hardware and software components which accomplish a workstream suite.
Total (Workstream) Throughput Time	The wallclock time from submission of the first instance of a workstream component to the successful program end of the last instance of a workstream component. In general, multiple workstream types and instances may be running on a particular target IT architecture. The Total Throughput Time for a workstream is defined in the context of all concurrent loads for the target IT architecture.
Workstream	A single instance of end-to-end processing.

SECTION D

PACKAGING AND MARKING

TABLE OF CONTENTS

D.1 PACKING FOR DOMESTIC SHIPMENT (CAR 1352.247-70)(MAR 2000)

Material shall be packed for shipment in such a manner that will ensure acceptance by common carriers and safe delivery at destination. Containers and closures shall comply with the Interstate Commerce Commission regulations, Uniform Freight Classification rules, or regulations of other carriers as applicable to the mode of transportation.

D.2 PACKING AND UNPACKING

The Contractor shall furnish such labor as may be necessary for packing, unpacking, and placement of equipment when in the possession of the Government without additional charge to the Government.

Supervision of packing, unpacking, and placement of the equipment shall be furnished by the Contractor without charge to the Government.

D.3 MARKING DELIVERABLES (CAR 1352.247-72)(MAR 2000)

The contract number shall be placed on or adjacent to all exterior mailing or shipping labels of deliverable items called for by the contract except for reports.

Mark deliverables, except for reports, for:

(TO BE PROVIDED AT CONTRACT AWARD)

Inspection and Acceptance

E.1 Contract Clauses Incorporated By Reference (FAR 52.252-2) (Feb 1988)

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this address: http://www.arnet.gov/far.

Clause Number	***Date***	***Title***
52.246-2	Aug 1996	Inspection of Supplies—Fixed Price
52.246-4	Aug 1996	Inspection of Services—Fixed Price
52.246-16	Apr 1984	Responsibility for Supplies

E.2 Standard of Performance and Acceptance of System(s)

In addition to the tests specified below, Acceptance is contingent upon compliance with all requirements described in Section C including, but not limited to, those pertaining to Networking Requirements (C.5.4) and IT Security Requirements (C.5.5). Data connectivity to and from the OCCS Backup facility in Gaithersburg, MD will be tested as well (see Table II a. in Section C). Acceptance is also contingent upon the delivery and correct functioning of any features offered beyond the requirements described in Section C. Acceptance is contingent upon successful completion of system certification and accreditation.

E.2.1 General

As subsystems may be delivered at different times and potentially to different locations, all applicable tests will be applied to each component after delivery is complete. Appropriate acceptance tests will be applied to all upgrade and replacement hardware and software. All tests will be performed at the discretion of the Government. These tests may be applied to replacement equipment, substituted equipment, modified equipment, and equipment supplied as remediation of any contractual shortfall. If any software upgrades are unable to meet test criteria, then the contractor is required to continue support for the

existing software complement until such time as the upgraded software can meet test criteria. All portions of the tests will be done during the same 30 consecutive day period within a 90 day window for each subsystem. Should the contractor fail to meet any of the tests, the contract may be terminated for default or the Government (at its discretion) may negotiate alternative remedies. Each subsystem will be accepted separately. Failure to meet a performance target may be remedied by providing additional or substitute hardware and software (any source code modifications to the benchmarks other than Class A must be approved by the Government). If additional or substitute hardware causes a facility impact, the contractor shall be required to remedy the facility impact.

The glossary in section C of this document will provide the definitions for terms used in this section.

E.2.2 Availability and Reliability

Each subsystem of the R & D HPCS shall be available at least 96% of the time. The minimum amount of time charged for a failed component within a subsystem will be four (4) hours. This will be tested during the acceptance test period with a job load supplied by the Government. This job load will include jobs submitted by both users and administrators of the system. Administrators may submit applications that have been shown to be problematic on previous systems. Some of these applications are available at http://rdhpcs.noaa.gov/TestCodes. All of the codes from the workstreams are expected to run on the subsystems for which they were bid.

The Government, at its discretion, may provide a series of carefully monitored workstreams that may include up to twenty-five (25) individual batch jobs. These workstreams will be monitored for end-to-end success. Complete or partial failure of any intermediate step will result in declaring the workstream to have failed. Success will be determined as the number of successful workstreams divided by the number of attempted workstreams in a 30 day period per subsystem. This ratio must be greater than 0.96 (96%) during the acceptance test period as well as during the life of the contract. Failures due to null time, application errors, or data errors will not be included in either the numerator or denominator of the above ratio.

E.2.3 Performance

E.2.3.1 Benchmark Performance

All of the workstreams associated with the subsystem must meet the performance criteria bid by the contractor. The interactive benchmarks associated with the workstreams will be run and tested by the Government. Failure to meet the performance criteria may not be remedied by performing any code modifications other than Class A to the benchmark codes unless these

modifications have been approved by the Government. Other remedies include substitution of hardware that is approved by the Government or by providing additional hardware identical to that already provided.

The results of the benchmarks will be used to calculate the potential system life throughput (SLT) for the tested subsystem. This must meet the SLT bid for the subsystem. The performance results will be used throughout the contract period (or until the installed system is replaced or upgraded).

E.2.3.2 Disk I/O Performance

When possible, all performance specifications indicated in the contractor's proposal will be verified. Any failures to meet the specifications shall be remedied or result in failure of the acceptance test.

E.2.3.3 Hierarchical Storage Management System (HSMS) Performance

The HSMS benchmarks related to the workstreams associated with the subsystem will be run on the HSMS. The bandwidth to and from the HSMS shall be tested by the Government during the acceptance test period. The ability to correctly retrieve files will be tested as well. Any failures of these tests will result in failure of the acceptance test. The Government will attempt to store and retrieve enough data to involve all components of the HSMS associated with a subsystem.

E.2.4 Reproducibility

Codes that are known to provide bit reproducible results may be run at the Government's discretion. If the codes fail to produce the same results for repeated runs in an environment where bit reproducibility is expected on the same type of hardware/software within a subsystem, then the acceptance test is deemed to be failed until the contractor can provide a remedy. The Government is required to perform these tests for the first time within the first 20 days of the acceptance test period for a subsystem.

E.2.5 Acceptance Test Spreadsheet

The COTR or an appropriate designee will construct and maintain during the acceptance tests (described in Section E.2) a spreadsheet which maintains all metrics designated by the acceptance test criteria and record all events, and the diagnosed causes, contributing to these metrics. The COTR, selected NOAA staff (including affiliates and contract staff) involved in the acceptance testing, and Contractor representatives will meet routinely during the acceptance test period to agree on event categorizations and descriptions, and validate the acceptance test criteria metrics.

E.3 Acceptance Documentation and Date of Acceptance

At the successful conclusion of the Acceptance Test the following documents will be produced: (1) Letter of Acceptance and (2) Acceptance Test Report.

Letter of Acceptance

The Letter of Acceptance for each subsystem is authored by the Contractor, and signed by both the Contractor and the Contracting Officer, upon successful completion of the E.2 acceptance test period and retroactively establishing the first day of the successful 30-day performance period.

Acceptance Test Report

Co-authored by the Contractor and the COTR and completed within three working days of execution of the Letter of Acceptance, the acceptance test report documents the events of the evaluation period and provides both a subjective assessment of the subsystem and an objective tabulation of acceptance test period events and results. Objective information to be included in the report are: the final values for all acceptance criteria metrics, a copy of the acceptance test spreadsheet, and a description of all events (including null time periods), as well as causes for and remedies of those events.

Charges shall commence on the first day of the successful performance period. The Government shall not accept equipment and shall not pay charges until the standard of performance is met.

E.3.1 Optional Period of Performance Acceptance

One four year optional period of performance is included in the contract. Acceptance of upgrades associated with the option will correspond with requirements in E.1 and E.2. System performance metrics will be determined based on the benchmark suite defined in Section J. The Government and the contractor may mutually agree to change the performance benchmarks at the beginning of the option period, otherwise the existing workstreams will be used. Any other changes to Acceptance requirements must be mutually agreeable between the Government and the contractor otherwise the requirements contained in this section shall apply.

E.4 DELAY OF START OF PERFORMANCE PERIOD

If necessary, the Government may delay the start of the acceptance period, but such a delay shall not exceed 30 consecutive days. Should the Government delay the start of the acceptance period, rental or maintenance charges shall accrue for that period of time between the installation date and the start of the

acceptance period and shall be paid upon completion of the successful acceptance period.

Inspection and Acceptance

E.1 Contract Clauses Incorporated By Reference (FAR 52.252-2) (Feb 1988)

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this address: http://www.arnet.gov/far.

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E.2 Standard of Performance and Acceptance of System(s)

In addition to the tests specified below, Acceptance is contingent upon compliance with all requirements described in Section C including, but not limited to, those pertaining to Networking Requirements (C.5.4) and IT Security Requirements (C.5.5). Data connectivity to and from the OCCS Backup facility in Gaithersburg, MD will be tested as well (see Table II a. in Section C). Acceptance is also contingent upon the delivery and correct functioning of any features offered beyond the requirements described in Section C. Acceptance is contingent upon successful completion of system certification and accreditation.

E.2.1 General

As subsystems may be delivered at different times and potentially to different locations, all applicable tests will be applied to each component after delivery is complete. Appropriate acceptance tests will be applied to all upgrade and replacement hardware and software. All tests will be performed at the discretion of the Government. These tests may be applied to replacement equipment, substituted equipment, modified equipment, and equipment supplied as remediation of any contractual shortfall. If any software upgrades are unable to meet test criteria, then the contractor is required to continue support for the

existing software complement until such time as the upgraded software can meet test criteria. All portions of the tests will be done during the same 30 consecutive day period within a 90 day window for each subsystem. Should the contractor fail to meet any of the tests, the contract may be terminated for default or the Government (at its discretion) may negotiate alternative remedies. Each subsystem will be accepted separately. Failure to meet a performance target may be remedied by providing additional or substitute hardware and software (any source code modifications to the benchmarks other than Class A must be approved by the Government). If additional or substitute hardware causes a facility impact, the contractor shall be required to remedy the facility impact.

The glossary in section C of this document will provide the definitions for terms used in this section.

E.2.2 Availability and Reliability

Each subsystem of the R & D HPCS shall be available at least 96% of the time. The minimum amount of time charged for a failed component within a subsystem will be four (4) hours. This will be tested during the acceptance test period with a job load supplied by the Government. This job load will include jobs submitted by both users and administrators of the system. Administrators may submit applications that have been shown to be problematic on previous systems. Some of these applications are available at http://rdhpcs.noaa.gov/TestCodes. All of the codes from the workstreams are expected to run on the subsystems for which they were bid.

The Government, at its discretion, may provide a series of carefully monitored workstreams that may include up to twenty-five (25) individual batch jobs. These workstreams will be monitored for end-to-end success. Complete or partial failure of any intermediate step will result in declaring the workstream to have failed. Success will be determined as the number of successful workstreams divided by the number of attempted workstreams in a 30 day period per subsystem. This ratio must be greater than 0.96 (96%) during the acceptance test period as well as during the life of the contract. Failures due to null time, application errors, or data errors will not be included in either the numerator or denominator of the above ratio.

E.2.3 Performance

E.2.3.1 Benchmark Performance

All of the workstreams associated with the subsystem must meet the performance criteria bid by the contractor. The interactive benchmarks associated with the workstreams will be run and tested by the Government. Failure to meet the performance criteria may not be remedied by performing any code modifications other than Class A to the benchmark codes unless these

modifications have been approved by the Government. Other remedies include substitution of hardware that is approved by the Government or by providing additional hardware identical to that already provided.

The results of the benchmarks will be used to calculate the potential system life throughput (SLT) for the tested subsystem. This must meet the SLT bid for the subsystem. The performance results will be used throughout the contract period (or until the installed system is replaced or upgraded).

E.2.3.2 Disk I/O Performance

When possible, all performance specifications indicated in the contractor's proposal will be verified. Any failures to meet the specifications shall be remedied or result in failure of the acceptance test.

E.2.3.3 Hierarchical Storage Management System (HSMS) Performance

The HSMS benchmarks related to the workstreams associated with the subsystem will be run on the HSMS. The bandwidth to and from the HSMS shall be tested by the Government during the acceptance test period. The ability to correctly retrieve files will be tested as well. Any failures of these tests will result in failure of the acceptance test. The Government will attempt to store and retrieve enough data to involve all components of the HSMS associated with a subsystem.

E.2.4 Reproducibility

Codes that are known to provide bit reproducible results may be run at the Government's discretion. If the codes fail to produce the same results for repeated runs in an environment where bit reproducibility is expected on the same type of hardware/software within a subsystem, then the acceptance test is deemed to be failed until the contractor can provide a remedy. The Government is required to perform these tests for the first time within the first 20 days of the acceptance test period for a subsystem.

E.2.5 Acceptance Test Spreadsheet

The COTR or an appropriate designee will construct and maintain during the acceptance tests (described in Section E.2) a spreadsheet which maintains all metrics designated by the acceptance test criteria and record all events, and the diagnosed causes, contributing to these metrics. The COTR, selected NOAA staff (including affiliates and contract staff) involved in the acceptance testing, and Contractor representatives will meet routinely during the acceptance test period to agree on event categorizations and descriptions, and validate the acceptance test criteria metrics.

E.3 Acceptance Documentation and Date of Acceptance

At the successful conclusion of the Acceptance Test the following documents will be produced: (1) Letter of Acceptance and (2) Acceptance Test Report.

Letter of Acceptance

The Letter of Acceptance for each subsystem is authored by the Contractor, and signed by both the Contractor and the Contracting Officer, upon successful completion of the E.2 acceptance test period and retroactively establishing the first day of the successful 30-day performance period.

Acceptance Test Report

Co-authored by the Contractor and the COTR and completed within three working days of execution of the Letter of Acceptance, the acceptance test report documents the events of the evaluation period and provides both a subjective assessment of the subsystem and an objective tabulation of acceptance test period events and results. Objective information to be included in the report are: the final values for all acceptance criteria metrics, a copy of the acceptance test spreadsheet, and a description of all events (including null time periods), as well as causes for and remedies of those events.

Charges shall commence on the first day of the successful performance period. The Government shall not accept equipment and shall not pay charges until the standard of performance is met.

E.3.1 Optional Period of Performance Acceptance

One four year optional period of performance is included in the contract. Acceptance of upgrades associated with the option will correspond with requirements in E.1 and E.2. System performance metrics will be determined based on the benchmark suite defined in Section J. The Government and the contractor may mutually agree to change the performance benchmarks at the beginning of the option period, otherwise the existing workstreams will be used. Any other changes to Acceptance requirements must be mutually agreeable between the Government and the contractor otherwise the requirements contained in this section shall apply.

E.4 DELAY OF START OF PERFORMANCE PERIOD

If necessary, the Government may delay the start of the acceptance period, but such a delay shall not exceed 30 consecutive days. Should the Government delay the start of the acceptance period, rental or maintenance charges shall accrue for that period of time between the installation date and the start of the

acceptance period and shall be paid upon completion of the successful acceptance period.

SECTION F
DELIVERIES OR PERFORMANCE

F.1 CLAUSES INCORPORATED BY REFERENCE (FAR 52.252-2)(FEB 1998)

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this address: http://www.arnet.gov/far

FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1)

NUMBER	DATE	TITLE
52.242-15	AUG 1989	STOP-WORK ORDER
52.242-17	APR 1984	GOVERNMENT DELAY OF WORK
52.247-35	APR 1984	F.O.B. DESTINATION, WITHIN CONSIGNEE'S PREMISES

F.2 TERM OF CONTRACT

Although the Government contemplates use of the system from date of acceptance through September 30, 2009, the term of this contract shall be a period from date of contract award through September 30, 2006. The Government currently has no monies available to fund the term of the contract. Therefore, this contract is subject to the availability of next fiscal year funds. In accordance with I.3, OPTION TO EXTEND THE TERM OF THE CONTRACT (FAR 52.217-9)(MAR 2000), the period of performance may be extended for three (3) additional twelve-month periods which, if exercised, will extend the contract period of performance to the end of FY2009 (September 30, 2009). Furthermore, this contract includes an option (Option Contract Period) which, if exercised, could extend the contract four additional years. The option contract period will be structured as a one-year base period with three additional annual options.

Also included in the contract is an option for the Government to extend the base contract period one additional year. The intent of this one-year option is to provide the Government sufficient time to complete a competitive follow-on acquisition should the four-year option contract period not be exercised. A similar one-year option is included in the contract to extend the option contract period to permit transition to a follow-on contractor if necessary. The total contract period If all options are exercised, could encompass nine years.

F.3 DOWNTIME CREDITS

Each component of the high performance computing system (HPCS) shall meet the availability requirements cited in Section C.6, Reliability and Availability Requirements. Failure to achieve the proposed system life throughput (SLT) may require that the Contractor deliver new equipment, at no additional cost to the Government, to make up for the shortfall in throughput as cited in Section C.6.1.2, Availability. Or, at the sole discretion of the Government, failure to achieve the proposed availability levels may result in the assessment of downtime credits.

F.3.1 Definitions

System downtime is defined in Section C, Appendix D, Definitions.

During any month, the available time on a system is defined as the length of the month multiplied by the proposed availability level for that system.

F.3.2 Period of Downtime

Downtime credit shall begin accruing if the system availability does not meet the criteria in Section C.6.1.2, Reliability, and C.6.1.3, Availability. System availability shall be determined monthly.

F.3.3 Credit for System Downtime

If the system(s) remains inoperable and cannot perform the workload due to an equipment or software malfunction through no fault or negligence of the Government, beyond the availability requirements of Section C.6, downtime credits shall accrue at the option of the Government. If, during any given month, the system(s) availability falls below the level specified in Section C.6.1.2, the Government shall pay a monthly lease amount based upon the percentage of time the system was operational. For example, if the system was only operational 95% of the required available time during a specific month because of system downtime, the Government would pay the Contractor 95% of the monthly lease charge for the system.

F.4 PLACE OF DELIVERIES/INSTALLATIONS

The Contractor shall be responsible for transportation to, and installation of all hardware and software at the following address:

TO BE SPECIFIED AT TIME OF CONTRACT AWARD

F.5 DELIVERY/INSTALLATION REQUIREMENTS

The Government reserves the right to delay the installation by up to 30 days, at no additional cost to the Government, provided that:

a) the Contractor shall receive written notice from the Contracting Officer 30 days prior to the scheduled installation date.

b) Any installation delays beyond 30 days shall be mutually agreed to by the Contractor and the Government.

The Government shall provide the Contractor with access to the site for purposes of installing the equipment prior to the scheduled installation date. The Contractor shall specify in writing in its proposal the time required for such access.

F.6 TIME OF DELIVERY

The initial system shall be delivered within 60 days after date of contract award.

SECTION G
CONTRACT ADMINISTRATIVE DATA

G.1 CONTRACTING OFFICER'S AUTHORITY (CAR 1352.201-70)(MAR 2000)

The Contracting Officer is the only person authorized to make or approve any changes in any of the requirements of this contract and notwithstanding any provisions contained elsewhere in this contract, the said authority remains solely in a Contracting Officer. In the event the Contractor makes any changes at the direction of any person other than the Contracting Officer, the change will be considered to have been made without authority and no adjustment will be made in the contract terms and conditions, including price.

G.2 CONTRACTING OFFICER'S TECHNICAL REPRESENTATIVE (COTR) (CAR 1352.201-71)(MAR 2000)

a. (To be designated at time of contract award) is hereby designated as the Contracting Officer's Technical Representative (COTR). The COTR may be changed at any time by the Government without prior notice to the Contractor by a unilateral modification to the Contract. The COTR is located at:

Address: TO BE DESIGNATED AT TIME OF AWARD
Telephone No.:
Facsimile Address:

b. The responsibilities and limitations of the COTR are as follows:

(1) The COTR is responsible for the technical aspects of the project and serves as technical liaison with the Contractor. The COTR is also responsible for the final inspection and acceptance of all reports, and such other responsibilities as may be specified in the Contract.

(2) The COTR is not authorized to make any commitments or otherwise obligate

the Government or authorize any changes which affect the Contract price, terms or conditions. Any Contractor request for changes shall be referred to the Contracting Officer directly or through the COTR. No such changes shall be made without the expressed prior authorization of the Contracting Officer. The Contracting Officer may designate assistant COTR(s) to act for the COTR by naming such assistant(s) in writing and transmitting a copy of such designation to the Contractor.

G.3 CONTRACT MANAGEMENT

Notwithstanding the Contractor's responsibility for total contract management during performance, administration of the contract will require maximum coordination between the Government and the Contractor.

G.3.1 CONTRACTING OFFICER'S TECHNICAL REPRESENTATIVE

The types of actions within the purview of the COTR's authority are to assure that the Contractor performs the technical requirements of the contract; to perform or cause to be performed inspections necessary in connection with performance of the contract; to maintain both written and oral communications with the Contractor concerning aspects of the contract within his purview; to issue written interpretations of technical requirements of Government drawings, designs, and specifications; to monitor the Contractor's performance under the contract and notify the Contractor and Contracting Officer of any deficiencies observed; and to coordinate Government furnished property availability and provide for site entry of Contractor personnel if required. A letter of designation will be issued to the COTR with a copy supplied to the Contractor, stating the responsibilities and limitations of the COTR. This letter will clarify to all parties to this contract the responsibilities of the COTR. At no time may the COTR effect changes to the contract which would result in a modification to the scope of work; changes in cost or price totals or estimates; changes in delivery dates; or changes in any other mutually-agreed upon term or provision of the contract.

G.3.2 CONTRACTING OFFICER

All contract administration will be effected by a Contracting Officer, address as shown on face page of this contract. Communications pertaining to contract administration matters will be addressed to the Contracting Officer. No changes in or deviation from the scope of work shall be effected without a Supplemental Agreement executed by a Contracting Officer authorizing such changes.

G.4 INVOICE REQUIREMENTS

(a) The Contractor shall submit invoices in triplicate directly to the Contracting Officer's Technical Representative (COTR). The Government will attach to the invoice a signed copy of the inspection report or for certification of receipt and acceptance on a copy of the contractor's bill. To constitute a proper invoice, the invoice must include, as a minimum, the following information and attached

documentation:

1) Name of the business concern, invoice number and invoice date.

2) Contract number.

3) Description, price and quantity of goods and services actually delivered or rendered.

4) Shipping and payment terms.

5) Name (where practical), title, telephone number, and complete mailing address of responsible official to whom payment is to be sent.

6) Other substantiating documentation or information as required by the contract.

(b) To assist the Government in making timely payments, the Contractor is requested to furnish the following additional information either on the invoice or on an attachment to the invoice:

1) Date(s) that property was delivered or services rendered

2) Serial Numbers of property delivered

3) Address where property was delivered or services were rendered

4) Credits (if applicable)

G.5 ADDITIONAL INVOICE AND PAYMENT PROVISIONS

The Contractor shall render invoices (3 copies) for basic monthly charges at the end of the month for which the charges accrue. Payments for rental and services of less than one month's duration shall be prorated at 1/30th of the basic monthly charge for each calendar day.

Any credits due the Government may be applied against the Contractor's invoices with appropriate information attached.

G.6 REMITTANCE ADDRESS

Offeror shall indicate in the space provided below the address to which payment should be mailed if different from the Offeror's address:

G.7 PRICING OF ADJUSTMENTS

When costs are a factor in any determination of contract price adjustment pursuant to the "Changes" clause or any other clauses of this contract, such costs shall be in accordance with the contract cost principles and procedures in Part 31 of the Federal Acquisition Regulation (48 CFR Part 31) in effect on the date of this contract.

G.8 GOVERNMENT FURNISHED PROPERTY (CAR 1352.245-70)(MAR 2000)

The Government will provide the following item(s) of Government property to the Contractor for use in the performance of this contract. This property shall be used and maintained by the Contractor in accordance with provisions of the "Government Property" clause included in this contract.

Item No.	Description	Quantity

SEE SECTION C, APPENDIX C, GOVERNMENT FURNISHED EQUIPMENT (GFE)

NOTE: THE FOLLOWING CLAUSE IS APPLICABLE TO INDEFINITE QUANTITY CLINs 0010 and 0011

G.9 AUTHORIZED ORDERING OFFICERS

Delivery Orders shall be issued only by those individuals listed below. The Contractor shall not deliver any equipment, software, or services unless ordered by one of the following authorized ordering officers:

Any duly appointed NOAA/Acquisition and Grants Office, Contracting Officer acting within the scope of their authority.

SECTION H

SPECIAL CONTRACT REQUIREMENTS

H.1 UNAUTHORIZED INSTRUCTIONS FROM GOVERNMENT PERSONNEL

a. The Contractor will not accept any instructions issued by any other person employed by the U.S. Government other than the Contracting Officer or the Contracting Officer's Technical Representative (COTR) acting within the limits of their authority.
b. No information, other than that which may be contained in an authorized modification to this contract will be considered as grounds for deviation from any stipulations of the contract's terms and conditions.

H.2 KEY PERSONNEL (CAR 1352.237-73) (MAR 2000)

a. The Contractor shall assign to this contract the following Key Personnel:

(Name) Position) (to be completed at award)

b. The Contractor shall obtain the consent of the Contracting Officer prior to making Key Personnel substitutions. Replacements for Key Personnel must possess qualifications equal to or exceeding the qualifications of the personnel being replaced specified.

c. Requests for changes shall be submitted to the Contracting Officer at least 15 working days prior to making any permanent substitutions. The request should contain a detailed explanation of the circumstances necessitating the proposed substitutions, complete resumes for the proposed substitutes, and any additional information requested by the Contracting Officer. The Contracting Officer will notify the Contractor within 10 working days after receipt of all required information of the decision on substitutions. The contract will be modified to reflect any approved changes.

H.3 NOTICE TO THE GOVERNMENT OF DELAYS

In the event the Contractor encounters difficulty in meeting performance requirements, or when it anticipates difficulty in complying with the contract delivery schedule or dates, or whenever the Contractor has knowledge that any actual or potential situation is delaying or threatens to delay the timely performance of this contract, the Contractor shall immediately notify the Contracting Officer and the COTR, in writing, giving pertinent details, provided, that this data shall be informational only in character and that this provision shall not be construed as a waiver by the Government of any delivery schedule or data or of any rights or remedies provided by law or under this contract.

H.4 ENGINEERING CHANGES

a. After contract award, the Government may solicit, and the Contractor is encouraged to propose, independently, engineering changes to the equipment, software specifications, or other requirements of this contract. These changes may be proposed to save money, to improve performance, to save energy, or to satisfy increased data processing requirements. If the proposed changes are acceptable to both parties, the Contractor shall submit a price change proposal to the Government for evaluation. Those proposed engineering changes that are acceptable to the Government will be processed as modifications to the contract.

b. This clause applies only to those proposed changes identified by the Contractor, as a proposal submitted pursuant to the provisions of this clause. As a minimum, the following information shall be submitted by the Contractor with each proposal:
   1. A description of the difference between the existing contract requirement and the proposed change, and the comparative advantages and disadvantages of each;
   2. Itemized requirements of the contract which must be changed if the proposal is adopted, and the proposed revision to the contract for each such change;
   3. An estimate of the changes in performance and cost, if any, that will result from adoption of the proposal;
   4. An evaluation of the effects the proposed change would have on collateral costs to the Government, such as Government-furnished property costs, costs of related items, and costs of maintenance and operation; and
   5. A statement of the time by which the change order adopting the proposal must be issued so as to obtain the maximum benefits of the changes during the remainder of this contract. Also, any effect on the contract completion time or delivery schedule shall be identified.

c. Engineering change proposals submitted to the Contracting Officer shall be

processed expeditiously. The Government shall not be liable for proposal preparation costs or any delay in acting upon any proposal submitted pursuant to this clause. The Contractor has the right to withdraw, in whole or in part, any engineering change proposal not accepted by the Government within the period specified in the engineering change proposal. The decision of the Contracting Officer as to the acceptance of any such proposal under this contract shall be final and shall not be subject to the "Disputes" clause of this contract.

d. The Contracting Officer may accept any engineering change proposal submitted pursuant to this clause by giving the Contractor written notice thereof. This written notice may be given by issuance of a modification to this contract. Unless and until a modification is executed to incorporate an engineering change proposal under this contract, the Contractor shall remain obligated to perform in accordance with the terms of the existing contract.

e. If an engineering change proposal submitted pursuant to this clause is accepted and applied to this contract, an equitable adjustment in the contract price and to any other affected provisions of this contract shall be made in accordance with this clause and other applicable clauses of this contract. When the cost of performance of this contract is increased or decreased as a result of the change, the equitable adjustment increasing or decreasing the contract price shall be in accordance with the "Changes" clause rather than under this clause, but the resulting contract modification shall state that it is made pursuant to this clause.

f. The Contractor is requested to identify specifically any information contained in the engineering change proposal which the Contractor considers confidential or proprietary and which the Contractor prefers not be disclosed to the public. The identification of information as confidential or proprietary is for informational purposes only and shall not be binding on the Government to prevent disclosure of such information. Offerors are advised that such information may be subject to release upon request pursuant to the Freedom of Information Act. (5 U.S.C. 552).

H.5 CONTRACTOR COMMITMENTS, WARRANTIES AND REPRESENTATIONS (ADP 52.239-1286) (APR 1984)

Any written commitment by the Contractor within the scope of this contract shall be binding upon the Contractor. Failure of the Contractor to fulfill any such commitment shall render the Contractor liable for liquidated or other damages due to the Government under the terms of this contract. For the purpose of this contract, a written commitment by the Contractor is limited to the proposal submitted by the Contractor, and to specific written modifications to the proposal. Written commitments by the Contractor are further defined as including (1) any warranty or representation made by the Contractor in a proposal as to hardware or software performance; total systems performance; other physical, design, or functioning characteristics of a machine, software package, or system, or installation date; (2) any warranty or representation made by the Contractor concerning the characteristics or specifications accompanying or referred to in a proposal; and (3) any modification of or affirmation or representation relating to the above which is made by the Contractor in or during the course of negotiations, whether or not incorporated into a formal amendment to the proposal in question.

H.6 INSURANCE COVERAGE (CAR 1352.228-70) (MAR 2000)

Pursuant to the clause "Insurance - Work on a Government Installation (FAR 52.228-5)," the Contractor will be required to present evidence to show, as a minimum, the amounts of insurance coverage indicated below:

(a) Workers Compensation and Employer's Liability. The Contractor is required to comply with applicable federal and state workers' compensation and occupational disease statutes. If occupational diseases are not compensable under those statutes, they shall be covered under the employer's liability section of the insurance policy, except when contract operations are so commingled with a Contractor's commercial operations that it would not be practical to require this coverage. Employer's liability coverage of at least $100,000 shall be required, except in states with exclusive or monopolistic funds that do not permit worker's compensation to be written by private carriers.

(b) General Liability.
1. The Contractor shall have bodily injury liability insurance coverage written on the comprehensive form of policy of at least $500,000 per occurrence.
2. Property Damage Liability Insurance shall be required in the amount of $20,000.

(c) Automobile Liability. The Contractor shall have automobile liability insurance written on the comprehensive form of policy. The policy shall provide for bodily injury and property damage liability covering the operation of all automobiles used in connection with performing the contract. Policies covering automobiles operated in the United States shall provide coverage of at least $200,000 per person and $500,000 per occurrence for bodily injury and $20,000 per occurrence for property damage.

(d) Aircraft Public and Passenger Liability. When aircraft are used in connection with performing the contract, the Contractor shall have aircraft public and passenger liability insurance. Coverage shall be at least $200,000 per person and $500,000 per occurrence for bodily injury, other than passenger liability, and $200,000 per occurrence for property damage. Coverage for passenger liability bodily injury shall be at least $200,000 multiplied by the number of seats or passengers, whichever is greater.

(e) Vessel Liability. When contract performance involves use of vessels, the Contracting Officer shall require, as determined by the agency, vessel collision liability and protection and indemnity liability insurance.

H.7 DEDUCTIBLES UNDER REQUIRED INSURANCE COVERAGE (CAR 1352.228-72) (MAR 2000)

When the Government is injured, wholly or partially as a result of the Contractor’s actions and such actions are covered by the insurance required by 1352.228-70, INSURANCE COVERAGE, the Government is entitled to recover from the Contractor the full amount of any such injury attributable to the Contractor regardless of any deductible. The Contracting Officer may offset the amount of recovery against any payment due to the Contractor.

H.8 TECHNOLOGY SUBSTITUTION

H.8.1 OVERVIEW

All items (e.g., hardware, system applications software) and support services (maintenance, training, documentation, installation, and technical support services) shall be the most modern and cost-effective available at the time of delivery and installation. The contractor shall propose substitute items whenever the contractor or its subcontractor is offering replacement or substitutes for the components in question and the contractor offers the particular product to any of its commercial or Government customers. The Government may request that those items be substituted for comparable items originally offered. The Government reserves the right to accept or reject proposed substitutions.

H.8.1.1 MINIMUM QUALIFICATIONS FOR ACCEPTANCE OF SUBSTITUTIONS

a. The substitute item shall meet or exceed the applicable requirements and specifications of this contract.
b. Any substitute item shall be fully compatible with the existing hardware and software installed at the time the substitute is proposed for use.
c. The substitute item shall have capacity and performance characteristics equal to or better than those of the component it is to replace. The criteria used originally for selecting the winning vendor's components will be used to determine acceptability of substitute items.
d. The substitute item shall offer the same or increased functionality as the item it is to replace.
e. The price of the item shall be equal to or more cost-effective than the item it is to replace, based on the same evaluation as done under the solicitation.

H.8.1.2 TECHNOLOGY SUBSTITUTION MODIFICATION PROCEDURE

To propose a substitute item, the contractor shall submit a written proposal to the Contracting Officer, addressing each of the applicable specifications in Section C and any other attributes of the substitute item of which the Government should be aware. Additionally, the contractor agrees to demonstrate the proposed item prior to delivery, if requested by the Government.

H.8.1.3 BENEFIT TO THE GOVERNMENT

All proposed technology modifications, substitutions, and additions to the contract shall be evaluated as to their benefit to the Government. In determining the comparative life-cycle costs of such proposals, the performance costs over the remaining life of the contract shall be considered.

H.8.1.4 SUBMISSION OF PROPOSALS

No equipment shall be substituted until the contractor has submitted a proposal to the Contracting Officer with adequate supporting justification. Furthermore, an agreement between the Contracting Officer and the contractor must also be reached and authorized, by written modification to the contract, to effect such substitution. The

Government may allow component substitutions when, in the opinion of the Contracting Officer, it is in the best interest of the Government to do so.

H.9 TECHNOLOGY SUBSTITUTION PLAN

a. The contractor is responsible for developing and maintaining, throughout the course of this contract, a technology substitution plan that conforms to Section H.8 and to the requirements in this section. This plan shall enable the contractor to propose, and the Government to consider, alternate hardware and software which meets the following characteristics:

    1) Meets at a minimum all of the applicable mandatory requirements of the solicitation
    2) Is functionally equivalent or superior to current items to be furnished under the contract
    3) Will maintain or improve successful systems performance
    4) Will facilitate or maintain ease of maintenance or use
    5) Will be supportable for the life of the contract
    6) Will provide a greater value to the Government than the hardware or software currently under contract.

b. Technology substitution specified in the plan and in Section H.8 is applicable only to hardware or software not yet installed at the time the improvement is authorized by the Government. Replacement of already-installed contractor hardware or software will be considered by the Government under the Engineering Change Proposal clause (H.4), should either the Government or the contractor so request.

c. Hardware or software installed pursuant to this clause shall be subject to the same warranties, maintenance credits, downtime credits, and acceptance procedures as items already under contract.

d. The contractor will be periodically evaluated on the quality of the technology substitution program, based upon the contractor's approved plan.

H.10 SUBCONTRACT REPORTS (DOC)

The Contractor shall submit subcontract reports in connection with performance of this contract; a report for subcontracting under this particular contract and a summary report when applicable (see paragraph b) on subcontracts in all contracts between the Contractor and the Department of Commerce which contain subcontract goals for awards to small business and small disadvantaged business concerns.

(a) The Contractor shall submit a subcontracting report for this contract on Standard Form 294 (Rev 12-98). The report shall be submitted semi-annually in accordance with the General Instructions on the reverse side of the form. The report shall be submitted to:

Distribution	Addressee
copy	Contracting Officer
original	U.S. Department of Commerce

Office of Small and Disadvantaged Business Utilization
14th & Constitution Ave., N.W.
HCHB, Room H-6411
Washington, D.C. 20230

(b) The Contractor shall submit a summary subcontract report on all of its contracts with the Department of Commerce which have subcontracting goals on Standard Form 295 (Rev 12-98). The report shall be submitted annually in accordance with the General Instructions on the reverse side of the form. The report shall be submitted no later than 15 days following the close of each reporting period. The report shall be submitted to:

Distribution	Addressee
copy	Contracting Officer
original	U.S. Department of Commerce Office of Small and Disadvantaged Business Utilization 14th & Constitution Ave., N.W. HCHB, Room H-6411 Washington, D.C. 20230

H.11 SUBCONTRACTING PLAN APPROVAL

The Subcontracting Plan submitted by _____*_____and dated ___*___ has been approved by the Government and is incorporated herein and made a part of this contract. Any modifications to this contract or modifications in excess of $500,000 ($1,000,000 for construction) will require modification of the Subcontracting Plan.

* To be completed at time of award

H.12 HARMLESS FROM LIABILITY (CAR 1352.233-70) (MAR 2000)

The Contractor shall hold and save the Government, its officers, agents, and employees harmless from liability of any nature or kind, including costs and expenses to which they may be subject, for or on account of any or all suits or damages of any character whatsoever resulting from injuries or damages sustained by any person or persons or property by virtue of performance of this contract, arising or resulting from the fault, negligence, wrongful act or wrongful omission of the Contractor, or any subcontractor, their employees, and agents.

H.13 COMPLIANCE WITH THE LAWS (CAR 1352.209-73)(MAR 2000)

The Contractor shall comply with all applicable laws and rules and regulations having the force of law which deal with or relate to performance hereunder or the employment by the Contractor of the employees.

H.14 ORGANIZATIONAL CONFLICT OF INTEREST (CAR 1352.209-71)(MAR 2000)

(A) The Contractor warrants that, to the best of the Contractor's knowledge and belief, there are no relevant facts or circumstances which would give rise to an organizational conflict of interest, as defined in FAR Subpart 9.5, or that the Contractor has disclosed all such relevant information.
(B) The Contractor agrees that if an actual or potential organizational conflict of interest is discovered after award, the Contractor will make a full disclosure in writing to the Contracting Officer. This disclosure shall include a description of actions which the Contractor has taken or proposes to take, after consultation with the Contracting Officer, to avoid, mitigate, or neutralize the actual or potential conflict.
(C) Remedies - The Contracting Officer may terminate this contract for convenience, in whole or in part, if it deems such termination necessary to avoid an organizational conflict of interest. If the Contractor was aware of a potential organizational conflict of interest prior to award or discovered an actual or potential conflict after award and did not disclose or misrepresented relevant information to the Contracting Officer, the Government may terminate the contract for default, debar the Contractor from Government contracting, or pursue such other remedies as may be permitted by law or this contract.
(D) The Contractor further agrees to insert provisions which shall conform substantially to the language of this clause, including the paragraph (c), in any subcontract or consultant agreement hereunder.

H.15 REGULATORY NOTICE (CAR 1352.252-70)(MAR 2000)

Contractors are advised that certain provisions and clauses identified with a Commerce Acquisition Regulation (CAR) notation for identification purposes, have not yet been incorporated into the CAR. However, all of these items are binding for this acquisition and will eventually be contained in the CAR at Part 13 of Title 48 of the Code of Federal Regulations.

H.16 SECURITY REQUIREMENTS FOR INFORMATION TECHNOLOGY RESOURCES (CAR 1352.239-73) (OCT 2003)

(a) This clause is applicable to all contracts that include information technology resources or services in which the Contractor must have physical or electronic access to DOC's sensitive or classified information, which is contained in systems that directly support the mission of the Agency. For purposes of this clause that term "Sensitive" is defined by the guidance set forth in:
(1) The DOC IT Security Program Policy and Minimum Implementation Standards (http://www.osec.doc.gov/cio/itmhweb/itmhweb1.html);
(2) The Office of Management and Budget (OMB) Circular A-130, Appendix III, Security of Federal Automated Information Resources, which states that there is a "presumption that all general support systems contain some sensitive information."; and
(3) The Computer Security Act of 1987 (P.L. 100-235) (http://www.epic.org/crypto/csa/csa.html), including the following definition of the term

sensitive information "... any information, the loss, misuse, or unauthorized access, to or modification of which could adversely affect the national interest or the, conduct of federal programs, or the privacy to which individuals are entitled under section 552a of title 5, United States Code (The Privacy Act), but which has not been specifically authorized under criteria established by an Executive Order or an Act of Congress to be kept secret in the interest of national defense or foreign policy." For purposes of this clause, the term "Classified" is defined by the guidance set forth in:

(1) The DOC IT Security Program Policy and Minimum Implementation Standards, Section 3.3.1.4 (http://www.osec.doc.gov/cio/itmhweb/itmhweb1.html);

(2) The DOC Security Manual, Chapter 18 (http://www.osec.doc.gov/osy/).

(3) Executive Order 12958, as amended, Classified National Security Information. Classified or national security information is information that has been specifically authorized to be protected from unauthorized disclosure in the interest of national defense or foreign policy under an Executive Order or Act of Congress. Information technology resources include, but are not limited to, hardware, application software, system software, and information (data). Information technology services include, but are not limited to, the management, operation (including input, processing, transmission, and output), maintenance, programming, and system administration of computer systems, networks, and telecommunications systems. The Contractor shall be responsible for implementing sufficient Information Technology security, to reasonably prevent the compromise of DOC IT resources for all of the contractor's systems that are interconnected with a DOC network or DOC systems that are operated by the Contractor.

(b) All Contractor personnel performing under this contract and Contractor equipment used to process or store DOC data, or to connect to DOC networks, must comply with the requirements contained in the DOC Information Technology Management Handbook (http://www.osec.doc.gov/cio/itmhweb/itmhweb1.html), or equivalent/more specific agency or bureau guidance as specified immediately hereafter (Not Applicable-No agency or bureau specific guidance).

(c) For all Contractor-owned systems for which performance of the contract requires interconnection with a DOC network or that DOC data be stored or processed on them, the Contractor Shall:

(1) Provide, implement, and maintain an IT Security Plan. This plan shall describe the processes and procedures that will be followed to ensure appropriate security of IT resources that are developed, processed, or used under this contract. The plan shall describe those parts of the contract to which this clause applies. The Contractor's IT Security Plan shall comply with federal laws that include, but are not limited to, the Computer Security Act of 1987 (40 U.S.C. 1441 et seq.) and the Federal Information Security Management Act of 2002, Pub. L. No. 107-347, 116 Stat. 2899, 2946-2961 (2002); Pub. L. No. 107-296, 116 Stat. 2135, 2259-2273 (2002). 38 WEEKLY COMP. PRES. DOC. 51, 2174 (Dec. 23, 2002) (providing statement by President George W. Bush regarding Federal Information Security Management Act of 2002). The plan shall meet IT security requirements in accordance with Federal and DOC policies and procedures that include, but are not limited to:

(a) OMB Circular A-130, Management of Federal Information Resources, Appendix III, Security of Federal Automated Information Resources;

(b) National Institute of Standards and Technology Special Publication 800-18, Guide for Developing Security Plans for Information Technology Systems; and

(c) DOC Procedures and Guidelines in the Information Technology Management Handbook (http://www.osec.doc.gov/cio/itmhweb/itmhweb1.html).

(d) National Industrial Security Program Operating Manual (NISPOM) for classified systems (http://www.dss.mil/isec/nispom.htm); and

(e) (Not Applicable-no agency of bureau specific guidance).

(2) The contractor shall continue submitting annually, for DOC Approval, a System Certification and Accreditation package, including the IT Security Plan and a system certification test plan, as outlined in DOC IT Security Program Policy, Sections 3.4 and 3.5. The Certification and Accreditation Package must be consistent with and provide further detail for the security approach contained in the offeror's proposal or sealed bid that resulted in the award of this contract and in compliance with the requirements stated in this clause. The Certification and Accreditation Package, as approved by the Contracting Officer, in consultation with the DOC IT Security Manager, or Agency/Bureau IT Security Manager/Officer, shall be incorporated as part of the contract. DOC will use the incorporated IT Security Plan as the basis for certification and accreditation of the contractor system that will process DOC data or connect to DOC networks. Failure to submit and receive approval of the Certification and Accreditation Package, as outlined in DOC IT Security Program Policy, Sections 3.4 and 3.5 (http://home.osec.doc.gov/DOC-IT-Security-Program-Policy.htm) may result in termination of the contract.

(d) The Contractor shall incorporate this clause in all subcontracts that meet the conditions in paragraph (a) of this clause.

(End of clause)

H.17 1352.239-74 SECURITY PROCESSING REQUIREMENTS FOR CONTRACTORS/SUBCONTRACTOR PERSONNEL FOR ACCESSING DOC INFORMATION TECHNOLOGY SYSTEMS (OCT 2003)

(a) Contractor personnel requiring any access to systems operated by the Contractor for DOC or interconnected to a DOC network to perform contract services shall be screened at an appropriate level in accordance with Commerce Acquisition Manual 1337.70, Security Processing Requirements for Service Contracts. DOC shall provide screening using standard personnel screening forms, which the Contractor shall submit to the DOC Contracting Officer's Technical Representative (COTR) based on the following guidance:

1) Contract personnel performing work designated Contract High Risk and personnel performing work designated Contract Moderate Risk in the information technology (IT) occupations and those with "global access" to an automated information system require a favorable pre-employment check before the start of

work on the contract, regardless of the expected duration of the contract. After a favorable pre-employment check has been obtained, the Background Investigation (BI) for Contract High Risk and the Minimum Background Investigation (MBI) for Contract IT Moderate Risk positions must be initiated within three working days of the start of work.

2) Contract personnel performing work designated Contract Moderate Risk who are not performing IT-related contract work do not require a favorable pre-employment check prior to their employment; however, the Minimum Background Investigation (MBI) must be initiated within three working days of the subject's start of work on the contract, regardless of the expected duration of the contract.

3) Contract personnel performing work designated Contract Low Risk will require a National Agency Check and Inquiries (NACI) upon the subject's start of work on the contract if the expected duration of the contract exceeds 365 calendar days. The NACI must be initiated within three working days of the subject's start of work on the contract.

4) Contract personnel performing work designated Contract Low Risk will require a Special Agreement Check (SAC) upon the subject's start of work on the contract if the expected duration of the contract (including options) exceeds 180 days but is less than 365 calendar days. The SAC must be initiated within three working days of the subject's start of work on the contract.

5) Contract personnel performing work on contracts requiring access to classified information must undergo investigative processing according to the Department of Defense National Industrial Security Program Operating Manual (NISPOM), (http://www.dss.mil/isec/nispom.htm) and be granted eligibility for access to classified information prior to beginning work on the contract. The security forms may be obtained from the cognizant DOC security office servicing your bureau, operating unit, or Departmental office. At the option of the government, interim access to DOC IT systems may be granted pending favorable completion of a pre-employment check. Final access may be granted only on completion of an appropriate investigation based upon the risk level assigned to the contract by the Contracting Officer.

(b) Within 45 days after this Modification, the Contractor shall certify in writing to the COTR that its employees, in performance of the contract, have completed annual IT security awareness training in DOC IT Security policies, procedures, computer ethics, and best practices, in accordance with DOC IT Security Program Policy, section 3.13. The COTR will inform the Contractor of any other available DOC training resources.

(c) Should the Contractor have access to DOC classified or sensitive information, the Contractor shall provide the COTR with signed Nondisclosure Agreements as specified in Commerce Acquisition Regulation (CAR), 1352.209-72, Restrictions Against Disclosures within five days of such access.

(d) The Contractor shall afford DOC, including the Office of Inspector General, access to the Contractor's and subcontractor's facilities, installations, operations, documentation, databases, and personnel used in performance of the contract. Access shall be provided to the extent required to carry out a program of IT inspection, investigation, and audit to safeguard against threats and hazards to the integrity,

availability, and confidentiality DOC data or to the function of computer systems operated on behalf of DOC, and to preserve evidence of computer crime.
(e) The Contractor shall incorporate this clause in all subcontracts that meet the conditions in paragraph (a) of this clause.

H.18 PRINTING

Unless otherwise specified in this contract, the Contractor shall not engage in, or subcontract for, any printing (as that term is defined in Title I of the Government Printing and Binding Regulations in effect on the effective date of this contract) in connection with performing under this contract. Provided, however, that performing a requirement under this contract involving the duplicating of less than 5,000 units of only one page, or less than 25,000 units in the aggregate of multiple pages, such pages not exceeding a maximum image size of 10 and ¾ inches by 14 and ¼ inches, will not be deemed printing.

H.19 PAYMENT OF ELECTRIC UTILITY BILLS

If the Contractor chooses to locate subsystems in the Government-provided facility in the Computer Building at Princeton, NJ (denoted as PRTN in Section C.11.3), the Contractor must pay the electric utility bill from the providing utility, PSE&G, commencing in the month in which the new equipment is first installed and terminated in the first month after the end of the contract. The Government will provide the Contractor with credits for monthly power usage, as indicated by the total kilowatt hours in the PSE&G bill, that exceed two times the monthly power usage for the Computer Building, as determined by the total kilowatt hours measured on the meter for the Computer Building substation for the same time period. During the transition from the previous HPC contract or to the subsequent HPC contract, the kilowatt hour total for the month as measured on the Computer Building substation will be pro-rated based on the daily steady-state ratings of the total equipment between the current contract and the previous or follow-on contract.

H.20 PROPOSAL FOR THE OPTION CONTRACT PERIOD

The system life for the HPCS is projected to encompass eight years (FY2006-FY2013). The contract will be divided into a base period (FY2006-2009), followed by an option period (FY2010-2013). The decision to exercise the option period in FY2010 will be made by evaluating a proposal, submitted to the Government by the incumbent contractor no later than March 31, 2009. The HPCS proposed for the option period (FY2010-2013) must offer a guaranteed increase in computational performance over the system delivered as the final substantial upgrade during the contract base period. Exercise of the contract option period will be based on performance during the base contract period and a proposal submitted for contract option period effort. The contract option period proposal shall include, at a minimum, the information and documentation described in the following paragraphs.

A. TECHNICAL PROPOSAL

The technical proposal follows a format similar to Solicitation DG133W-05-RP-1038 and must include the following sections:

TAB 1 PROCUREMENT OBJECTIVES

Demonstrate an understanding of NOAA's required period of performance for this contract as described in section C.1. Demonstrate an understanding of NOAA's need for additional processing power to meet increasing mission requirements as described in section C.1.

Demonstrate your understanding of NOAA's need to acquire balanced, comprehensive computing capabilities in order to advance NOAA's research and development activities in environmental modeling as described in section C.1. Demonstrate your understanding of NOAA's new approach for managing its HPC resources based on its functional requirements as described in C.1.

Explain how your proposed solution meets NOAA's current programmatic requirements, as represented by the funding profile presented in Table I in section C.4.3, and how your proposed solution can adapt to possible changes in these requirements.

TAB 2 BENCHMARKS

Describe how the benchmark requirements described in section C.4.2 will be achieved during the option contract period. Include in the description a detailed plan for meeting the requirement for maximum System Life Throughput obtained by a significant mid-life upgrade that will not front-load or back-load performance. Follow the instructions that are described in Section J for submitting benchmark results.

TAB 3 HPC SUB-SYSTEM COMPONENTS

Provide a high level system description of the proposed R&D HPCS that meets the requirements described in section C.5 for the option contract period. Describe system components, such as nodes and interconnect fabric, and the overall architecture of the system with particular attention to performance and system dependability. Describe design aspects that maximize performance such as different node types, memory distribution, etc. Include diagrams and specifications of all major sub-system components. Include in the description the rationale used to select the various brand components that comprise the proposed HPCS. List the various brand components that were considered along with any performance specifications or test results that were used in the selection of the proposed HPCS. Describe if the Offeror will provide the Government with any pre-delivery access to the system and how it will be implemented.

TAB 3.1 Large Scale Computing Component (LSC)
Describe how the proposed LSC will meet the requirements described in section C.5.1.1

for the option contract period. Include in this description the calculation used to compute the system life throughput for the LSC.

TAB 3.2 Development Component
Describe how the proposed developmental component will meet the requirements described in section C.5.1.2 for the option contract period.

TAB 3.3 Post processing and Analysis Component
Describe how the proposed post processing and analysis component will meet the requirements described in section C.5.1.3 for the option contract period.

TAB 3.4 Data Management Requirement
Describe how the proposed system will provide data integrity and provide at least 99% availability for data access as required in section C.5.2 for the option contract period.

TAB 3.4.1 Home File System (HFS)
Describe how the proposed HFS will meet the requirements described in section C.5.2.1 for the option contract period.

TAB 3.4.2 Fast Scratch File System (FSFS)
Describe how the proposed FSFS will meet the requirements described in section C.5.2.2 for the option contract period.

TAB 3.4.3 Long Term Scratch File System (LTSFS)
Describe how the proposed LTSFS will meet the requirements described in section C.5.2.3 for the option contract period.

TAB 3.4.4 Hierarchical Storage Management System (HSM)
Describe how the proposed HSMS will meet the requirements described in section C.5.2.4 for the option contract period. Include in the description such things as: how the HSMS software searches for archived files on a tape, if the tape drive's fast-search features will be used, show a calculation of the aggregate tape positioning rate for small frequently used files, and a calculation for the large files in the near-line tier, describe the process or mechanism for identifying tapes that have become broken, describe the process for recovering data from tapes that have been physically damaged and how the legacy archived will be addressed.

TAB 3.4.5 Data Generation Profile
Describe how the proposed data management system will be able to support the data volumes detailed in section C.5.2.5.1and C.5.2.5.2 for each workstream for the option contract period

TAB 3.4.6 Data Retention Profile
Describe how the proposed data management system will be able to support the data volumes detailed in Table III in section C.5.2.6 for the option contract period.

TAB 3.4.7 Automated Backup
Describe the hardware, software, and process the will be used to meet the requirements in section C.5.2.7 for the option contract period.

TAB 4 SOFTWARE REQUIREMENTS

TAB 4.1 Resource Management Software
Describe the software that will be implemented to meet the requirements in section C.5.3.1 for the option contract period. Indicate whether or not any of the desired features that are mention in this section will also be met with this solution. Include a description of how the software is licensed.

TAB 4.2 Batch Queuing Software
Describe the software that will be implemented to meet the requirements in section C.5.3.2 for the option contract period. Indicate whether or not any of the desired features that are mention in this section will also be met with this solution.

TAB 4.3 Programming Environment Software
Describe how the software listed in section C.5.3.3 will be provided and provisioned across the R&D HPCS for the option contract period. Include a description of how the software will be licensed.

TAB 4.4 COTS
Describe how the software listed in section C.5.3.4 will be provided and provisioned across the R&D HPCS. Include a description of how the software will be licensed for the option contract period.

TAB 4.5 Community Supported Software
Describe how the software listed in section C.5.3.5 will be provided and provisioned across the R&D HPCS. Include a description of how the software will be licensed for the option contract period.

TAB 4.6 Proposed Software
If the proposal contains any software that was not specifically required, the contractor will provide information pertaining to the installed base of any such software.

TAB 4.7 System Software
Describe how node operating system (OS) upgrades will affect application

programs and job scripts. Describe the expected impact of upgrades of the OS on libraries pertaining to numerical results with respect to object files. Describe how OS upgrades will be managed. Describe the resources that will be used to test OS and application software upgrades. If checkpoint/restart capabilities are offered, describe what is being provided and how it will work.

TAB 5 NETWORK REQUIREMENTS

Provide a description and diagram(s) of the proposed network architecture that will be implemented to meet the requirements in section C.5.4 for the option contract period. Include expected data transfer rates and expected response times. The proposal should clearly indicate how the requirements for data browsing, interactive debugging and file editing at the required frame rates per second and quality of service will be met. Describe how the proposed network solution will meet the needs of the categories of users at each of their locations described in section C.5.4.1.

TAB 5.1 User Profile

TAB 5.1.1 User profile for WS7-WS9
Describe how the network architecture being proposed will meet the requirements described in section C.5.4.1.1 for the option contract period.

TAB 5.1.2 User profile for WS4-WS6
Describe how the network architecture being proposed will meet the requirements described in section C.5.4.1.2 for the option contract period.

TAB 5.1.3 User profile for WS1-WS3
Describe how the network architecture being proposed will meet the requirements described in section C.5.4.1.3 for the option contract period.

TAB 5.2 Wide Area Network Component
Describe any additional connectivity that is being provided as a part of the proposed solution in order to meet the requirements in section C.5.4.2. If not already included in the response to L.6.1.5, provide network diagrams and specifications.

TAB 5.3 Describe how remote users will access the R&D HPCS and specify expected response times that a typical remote user might experience during a typical interactive session.

TAB 5.4 High bandwidth connectivity to model and observation data
Describe how the proposed solution will deliver the data described in section C.5.4.3 to the appropriate works streams. If not already included, provide diagrams and specifications of any additional network resources that is being provided to meet this requirement

TAB 6 IT SECURITY

Describe the IT security hardware, software, and procedures that will be incorporated into the design of the proposed system that meet the requirements of section C.5.5 for the option contract period. Provide diagrams and specifications of all equipment that is proposed.

TAB 7 RELIABILITY AND AVAILABILITY REQUIREMENTS

During the option contract period describe how the Contractor will provide support for the requirements in section C.6.1.

TAB 7.1 Downtime
Describe your understanding of what constitutes downtime and the elements described in section C.6.1.1.

TAB 7.2 Availability
Describe your understanding of how availability will be measured as described in section C.6.1.2. Include in the description any tools that will be implemented. Provide a table that shows the system life throughput for each workstream for each year of the base period of the contract.

TAB 8 SUPPORT SERVICES REQUIREMENTS

TAB 8.1 Support
Describe your support structure that will be implemented to meet the 96% system availability as described in section C.7.1 for the option contract period.

TAB 8.2 Training
Describe how the training requirements listed in section C.7.2 will be met for the option contract period.

TAB 9 PROJECT MANAGEMENT REQUIREMENTS

Give a brief description of how the project is to be organized, staffed, and managed, identifying all subcontractors that meet the requirements stated in section C.8.1. Include in the description the number of software engineers, hardware engineers, and applications analysts proposed, and describe their qualifications and duties.

TAB 9.1 Transition to “One NOAA”
NOAA requires the Offeror to provide a transition plan over the term of the base period of this contract to move NOAA from its current organization-based business processes toward the “One NOAA” approach identified in section C.8.2 The transition plan will identify the approach proposed to be followed; the various components to be used; the phasing of the various components; the

testing plan; and the final state of the transition at the end of the base period. The vendor will include use cases describing how the user will work at the various phases of the implementation of the integration. In proposing a solution, the vendor shall identify the costs and the performance trade-offs necessary to implement the solution.

TAB 9.2 Documentation
Provide a description of how the Offeror proposes to provide the various documents described in section C.8.3.

TAB 9.3 Configuration Management and Change Management Plan
Provide a detailed description of how the configuration management and any associated change processes for the R&D HPCS will be maintained over the life of the contract as described in section C.8.4.

TAB 9.4 Contract Transition Plans
Provide a detailed description and plan covering the transition period from the existing contract to this new contract as described in section C.8.4.

B. PRICE PROPOSAL

The contractor is required to provide a detailed pricing proposal that includes all cost elements by month (e.g., lease cost, hardware maintenance, software maintenance, on-site support, etc.) for the option period of the contract. The contractor is required to submit separate pages for each contract year depicting all costs. If alternate methods of acquisition are proposed, a separate proposal for each acquisition method must be submitted.

The contractor is required to include the following in its price proposal:

A. Price for hardware by item.

B. Price for software. Provide monthly pricing for each item of software offered. Indicate if it is leased software or purchased software.

C. A breakout by labor category of all services proposed (e.g., hardware, maintenance, software maintenance, on-site applications analyst, etc.) and total price for each item. A separate breakout is required for each year of the option contract period.

D. A detailed description and breakout of any other price proposed (e.g. communications, power, cooling, etc.)

E. Separate pricing for all of the options described in section C.9.

Any lease resulting from this Solicitation must be determined an “operating lease” in

accordance with the policies set forth in Office of Management and Budget (OMB) Circular A-11 and the Federal Accounting Standards Advisory Board (FASAB). Accordingly, the contractor is required to submit the following pricing information for the option contract period:

1. monthly lease price by component
2. monthly lease price for each software package
3. monthly maintenance price for leased hardware and software
4. monthly price associated with taxes
5. monthly price associated with insurance
6. monthly facilities rental (if applicable)
7. Communication costs (if applicable)
8. Power and cooling costs
9. Interest rate used to calculate lease payments.

In addition, the contractor shall provide the fair market value (FMV) price for each proposed hardware component and software package and the basis for the FMV (e.g., GSA Federal Supply Schedule price, published commercial price, etc.)

C. FACILITY PROPOSAL (If Applicable)

The contractor shall submit a facility proposal that consists of facility sub-proposals for each site that is proposed. If any of the Government-provided facilities described in Section C.11 are to be used, the Contractor must provide the following for each facility:

1) A detailed site-preparation plan that prescribes facility modifications, with schedule, that are required for initial equipment installation and any subsequent equipment transitions during the base contract. Contractors that propose to use BLDR-1 and/or BLDR-2 must provide a detailed description of site modifications, including cost estimate, so that credits can be provided to the Government for work to be completed by GSA contractors.
2) A plan indicating expected usage of facility resources (e.g., raised floor space, peak power load, peak cooling load) as a function of time throughout the base contract
3) Identification of any additional resources required by the Contractor's proposal that are above those projected by the Government to be available and a plan indicating how these resources would be obtained
4) Equipment characteristics of each major component, including:
    - Equipment dimensions, weight, and quantity
    - Cooling requirements and cooling design
    - Power requirements and power distribution design
5) Analysis of each proposed system configuration to demonstrate sufficient UPS
6) capacity graceful system shutdown
7) Identification of any site-restricted GFE equipment that the Contractor proposes

to use, including any refurbishment or enhancement that is needed

8) Identification of any unrestricted GFE equipment from another Government site that the Contractor proposes to use. Proposed shipping arrangements should be identified, including procedures for its return at the end of the contract.
9) Any additional facility enhancements, with implementation plan, that the Contractor proposes in order to assure robust operation

If any Contractor-provided facility is proposed, the Contractor must provide the following in the facility proposal:

1) A copy of the site operating plan, including facility management procedures
2) A copy of the physical security procedures
3) A statement of how NOAA remote computer operators would be informed of deteriorating facility conditions such as rising room temperatures or an air handler failure
4) A copy of the facility's disaster recovery plan
5) One-line (logic) diagrams of the electrical service and cooling service
6) An energy density (watts per square foot) projection plotted over the contract life
7) A spreadsheet listing the type and age of facility equipment to be used. Examples are: UPS systems and power conditioners, chillers, heat exchangers, air handlers
8) A copy of the contract statement of work for any commercial facility management company used, or the equivalent if performed in-house. Preventative maintenance schedules, proactive inspections, and quality assurance methods are examples
9) A brief (2-3 paragraphs) description of the procedures used to acquire off-site emergency service, including minimum response times and escalation procedures
10) A statement (one paragraph) as to how coverage and services are made available after-hours and on holidays
11) A statement (paragraph) projecting the minimum UPS power protection period (survival time) that is required, when utility power fails, in order to assure graceful system shutdown. Also provide a maintenance schedule on UPS systems that would address any UPS deterioration.
12) A brief description of the fire protection systems and certification standards
13) A brief description of any automated facility controls such as computer-managed failover systems
14) A bio (curriculum vitae) of the facility manager's experience and training
15) A description of facility alterations and changes to be made to the offered space if the Offeror is successful
16) A list of all unrestricted Government furnished equipment to be used, including a schedule for shipment to the site and procedures for its return at the end of the contract

H.20 RESTRICTIONS AGAINST DISCLOSURE (CAR 1352.209-72)(MAR 2000)

a. The Contractor agrees, in the performance of this contract, to keep the information furnished by the Government and designated by the Contracting Officer or Contracting Officer's Technical Representative in the strictest confidence. The Contractor also agrees not to publish or otherwise divulge such information in whole or in part, in any manner or form, nor to authorize or permit others to do so, taking such reasonable measures as are necessary to restrict access to such information while in the Contractor's possession, to those employees needing such information to perform the work provided herein, i.e., in a "need to know" basis. The Contractor agrees to immediately notify the Contracting Officer in writing in the event that the Contractor determines or has reason to suspect breach of this requirement.

b. The Contractor agrees that it will not disclose any information described in subsection a. to any persons or individual unless prior written approval is obtained from the Contracting Officer, The Contractor agrees to insert the substance of this clause in any consultant agreement of subcontract hereunder.

PART II - CONTRACT CLAUSES

SECTION I - CONTRACT CLAUSES

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I.1 CLAUSES INCORPORATED BY REFERENCE (FAR 52.252-2) (FEB 1998)

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this address: http://www.arnet.gov/far

CLAUSE NUMBER	DATE	TITLE
52.202-1	JUL 2004	DEFINITIONS
52.203-3	APR 1984	GRATUITIES
52.203-5	APR 1984	COVENANT AGAINST CONTINGENT FEES
52.203-6	JUL 1995	RESTRICTIONS ON SUBCONTRACTOR SALES TO THE GOVERNMENT
52.203-7	JUL 1995	ANTI-KICKBACK PROCEDURES
52.203-8	JAN 1997	CANCELLATION, RESCISSION, AND RECOVERY OF FUNDS FOR ILLEGAL OR IMPROPER ACTIVITY
52.203-10	JAN 1997	PRICE OR FEE ADJUSTMENT FOR ILLEGAL OR IMPROPER ACTIVITY
52.203-12	JUN 2003	LIMITATION ON PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS
52.204-4	AUG 2000	PRINTING/COPYING DOUBLE SIDED ON RECYCLED PAPER
52.204-7	OCT 2003	CENTRAL CONTRACTOR REGISTRATION
52.209-6	JAN 2005	PROTECTING THE GOVERNMENT'S INTEREST WHEN SUBCONTRACTING WITH CONTRACTORS DEBARRED, SUSPENDED, OR PROPOSED FOR DEBARMENT

CLAUSE NUMBER	DATE	TITLE
52.211-5	AUG 2000	MATERIALS REQUIRED
52.215-2	JUN 1999	AUDIT AND RECORDS -- NEGOTIATION
52.215-8	OCT 1997	ORDER OF PRECEDENCE –- UNIFORM CONTRACT FORMAT
52.215-11	OCT 1997	PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA –- MODIFICATIONS
52.215-13	OCT 1997	SUBCONTRACTOR COST OR PRICING DATA –- MODIFICATIONS
52.215-14	OCT 1997	INTEGRITY OF UNIT PRICES
52.215-15	OCT 2004	PENSION ADJUSTMENTS AND ASSET REVERSIONS
52.215-18	OCT 1997	REVERSION OR ADJUSTMENT OF PLANS FOR POST RETIREMENT BENEFITS OTHER THAN PENSIONS (PRB)
52.215-19	OCT 1997	NOTIFICATION OF OWNERSHIP CHANGES
52.215-21	OCT 1997	REQUIREMENTS FOR COST OR PRICING DATA OR INFORMATION OTHER THAN COST OR PRICING DATA –- MODIFICATIONS
52.219-4	OCT 2004	NOTICE OF PRICE EVALUATION PREFERENCE FOR HUBZONE SMALL BUSINESS CONCERNS
52.219-8	MAY 2004	UTILIZATION OF SMALL BUSINESS CONCERNS
52.219-9	JAN 2002	SMALL BUSINESS SUBCONTRACTING PLAN ALTERNATE II (OCT 2001)
52.219-16	JAN 1999	LIQUIDATED DAMAGES – SUBCONTRACTING PLAN
52.222-3	JUN 2003	CONVICT LABOR
52.222-19	JUN 2004	CHILD LABOR - COOPERATION WITH AUTHORITIES AND REMEDIES
52.222-21	FEB 1999	PROHIBITION OF SEGREGATED FACILITIES
52.222-26	APR 2002	EQUAL OPPORTUNITY
52.222-35	DEC 2001	EQUAL OPPORTUNITY FOR SPECIAL DISABLED VETERANS, VETERANS OF THE VIETNAM ERA, AND OTHER ELIGIBLE VETERANS
52.222-36	JUN 1998	AFFIRMATIVE ACTION FOR WORKERS WITH DISABILITIES
52.222-37	DEC 2001	EMPLOYMENT REPORTS ON SPECIAL DISABLED VETERANS, VETERANS OF THE VIETNAM ERA, AND OTHER ELIGIBLE VETERANS
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52.225-5	JAN 2005	TRADE AGREEMENTS
52.225-8	FEB 2000	DUTY-FREE ENTRY

CLAUSE NUMBER	DATE	TITLE
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52.228-5	JAN 1997	INSURANCE –- WORK ON A GOVERNMENT INSTALLATION
52.229-1	APR 1984	STATE AND LOCAL TAXES (Applies to indefinite-delivery CLINs)
52.229-3	APR 2003	FEDERAL, STATE, AND LOCAL TAXES
52.232-1	APR 1984	PAYMENTS
52.232-8	FEB 2002	DISCOUNTS FOR PROMPT PAYMENT
52.232-11	APR 1984	EXTRAS
52.232-17	JUN 1996	INTEREST
52.232-23	JAN 1986	ASSIGNMENT OF CLAIMS
52.232-25	OCT 2003	PROMPT PAYMENT
52.232-33	OCT 2003	PAYMENT BY ELECTRONIC FUNDS TRANSFER – CENTRAL CONTRACTOR REGISTRATION
52.233-1	JUL 2002	DISPUTES (ALT I [DEC 1991])
52.233-3	AUG 1996	PROTEST AFTER AWARD
52.233-4	OCT 2004	APPLICABLE LAW FOR BREACH OF CONTRACT CLAIM
52.237-2	APR 1984	PROTECTION OF GOVERNMENT BUILDINGS, EQUIPMENT AND VEGETATION
52.242-13	JUL 1995	BANKRUPTCY
52.243-1	AUG 1987	CHANGES -- FIXED-PRICE
52.244-2	AUG 1998	SUBCONTRACTS
52.244-6	DEC 2004	SUBCONTRACTS FOR COMMERCIAL ITEMS
52.245-2	MAY 2004	GOVERNMENT PROPERTY (FIXED-PRICE CONTRACTS)
52.245-11	APR 1984	GOVERNMENT PROPERTY (FACILITIES USE)
52.248-1	FEB 2000	VALUE ENGINEERING
52.249-2	MAY 2004	TERMINATION FOR CONVENIENCE OF THE GOVERNMENT (FIXED-PRICE)
52.249-8	APR 1984	DEFAULT (FIXED-PRICE SUPPLY AND SERVICE)
52.253-1	JAN 1991	COMPUTER GENERATION OF FORMS BY THE PUBLIC

I.2 OPTION FOR INCREASED QUANTITY-SEPARATELY PRICED LINE ITEM (FAR 52.217-7) (MAR 1989)

The Government may require the delivery of the numbered line item, identified in the Schedule as an option item, in the quantity and at the price stated in the Schedule. The Contracting Officer may exercise the option by written notice to the Contractor at any time during the life of the contract. Delivery of added items shall continue at the same rate that like items are called for under the contract, unless the parties otherwise agree.

I.3 OPTION TO EXTEND THE TERM OF THE CONTRACT (FAR 52.217-9) (MAR 2000)

(a) The Government may extend the term of this contract by written notice to the Contractor prior to expiration of the contract; provided that the Government gives the Contractor a preliminary written notice of its intent to extend at least 30 days before the contract expires. The preliminary notice does not commit the Government to an extension.
(b) If the Government exercises this option, the extended contract shall be considered to include this option clause.
(c) The total duration of this contract, including the exercise of any options under this clause, shall not exceed nine (9) years.

I.4 AVAILABILITY OF FUNDS (FAR 52.232-18) (APR 1984)

Funds are not presently available for this contract. The Government's obligation for performance of this contract is contingent upon the availability of appropriated funds from which payment for contract purposes can be made. No legal liability on the part of the Government for any payment may arise until funds are made available to the Contracting Officer for this contract and until the Contractor receives notice of such availability, to be confirmed in writing by the Contracting Officer.

NOTE: THE FOLLOWING CLAUSES ARE APPLICABLE TO THE INDEFINITE QUANTITY CLINs 0010 and 0011

1.5 ORDERING (FAR 52.216-18) (OCT 1995)

(a) Any supplies and services to be furnished under this contract shall be ordered by issuance of delivery orders or task orders by the individuals or activities designated in the Schedule. Such orders may be issued from date of contract award through the life of the contract.
(b) All delivery orders or task orders are subject to the terms and conditions of this contract. In the event of conflict between a delivery order or task order and this contract, the contract shall control.
© If mailed, a delivery order or task order is considered "issued" when the Government

deposits the order in the mail. Orders may be issued orally, by facsimile, or by electronic commerce methods only if authorized in the Schedule.

I.6 ORDER LIMITATIONS (FAR 52.216-19) (OCT 1995)

(a) Minimum order. When the Government requires supplies or services covered by this contract in an amount of less than $100,000 for CLIN 0010 and $5,000 for CLIN 0011, the Government is not obligated to purchase, nor is the Contractor obligated to furnish, those supplies or services under the contract.

(b) Maximum order. The Contractor is not obligated to honor -

(1) Any order for a single item in excess of $25,000,000 for CLIN 0010 and $500,000 for CLIN 0011;

(2) Any order for a combination of items in excess of $50,000,000 for CLIN 0010 and $5,000,000 for CLIN 0011; or

(3) A series of orders from the same ordering office within 5 days that together call for quantities exceeding the limitation in subparagraph (1) or (2) above.

(c) If this is a requirement contract (i.e., includes the Requirements clause at subsection 52.216-21 of the Federal Acquisition Regulation (FAR), the Government is not required to order a part of any one requirement from the Contractor if that requirement exceeds the maximum-order limitation in paragraph (b) above.

(d) Notwithstanding paragraphs (b) and (c) above, the Contractor shall honor any order exceeding the maximum order limitation in paragraph (b), unless that order (or orders) is returned to the ordering office within 10 days after issuance, with written notice stating the Contractor's intent not to ship the item (or items) called for and the reasons. Upon receiving this notice, the Government may acquire the supplies from another source.

I.7 INDEFINITE QUANTITY (FAR 52.216-22) (OCT 1995)

(a) This is an indefinite quantity contract for the supplies or services specified, and effective for the period stated, in the Schedule. The quantities of supplies and services specified in the Schedule are estimates only and are not purchased by this contract.

(b) Delivery or performance shall be made only as authorized by orders issued in accordance with the Ordering clause. The Contractor shall furnish to the Government, when and if ordered, the supplies or services specified in the Schedule up to and including the quantity designated in the Schedule as the "maximum." The Government shall order at least the quantity of supplies or services designated in the Schedule as the "minimum."

(c) Except for any limitations on quantities in the Order Limitations clause or in the Schedule, there is no limit on the number of orders that may be issued. The Government may issue orders requiring delivery to multiple destinations or performance at multiple locations.

(d) Any order issued during the effective period of this contract and not completed within that period shall be completed by the Contractor within the time specified in the order. The contract shall govern the Contractor's and Government's rights and obligations with respect to that order to the same extent as if the order were completed during the contracts effective period; provided, that the Contractor shall not be required to make any deliveries under this contract after the expiration of the contract award.

PART III

SECTION J - LIST OF DOCUMENTS, EXHIBITS, AND OTHER ATTACHMENTS

J.1 BENCHMARK INSTRUCTIONS (34 Pages)
J.2 BENCHMARK PERFORMANCE RESULTS (19 Pages)
J.3 PERFORMANCE EVALUATION REPORT OF CONTRACTOR (3 Pages)

PAST PERFORMANCE EVALUATION QUESTIONNAIRE
U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
ACQUISITION MANAGEMENT DIVISION

CONTRACT INFORMATION

a) Contractor:

b) Contract Number:

c) Type of Contract:
[ ] Negotiated or [ ] Sealed Bid [ ] Competitive or [ ] Non-Competitive

[ ] Fixed Price: type: _____ [ ] Cost: type:

d) Period of Performance: From: _____ To:

e) Initial Contract Value: _____ Final Contract Value:

f) Brief Description of Requirement:

g) Complexity of Effort (Check One): [ ] Difficult [ ] Routine

RATER INFORMATION

Please provide the information requested below to assist the NOAA in tracking responses and resolving conflicts. This information will be kept confidential.

Name: _____ Organization:

Telephone/FAX Nos:

Mailing Address:

Position Title/Grade:

Length of Involvement in Contract:

Questionnaire Completion Date:

Solicitation No.: DG1330-05-RP-1038

PAST PERFORMANCE EVALUATION REPORT OF CONTRACTOR
(Check Appropriate Box)

PERFORMANCE ELEMENTS *	OUTSTANDING	GOOD	ACCEPTABLE	MARGINAL	INADEQUATE	UNACCEPTABLE
1. Quality of Products or Services, Compliance with contract requirements, and technical excellence						
2. Statistical analysis of dependability						
3. Timeliness of Performance						
4. Cost Control, Budget Restraint and Efficiency						
5. Customer Satisfaction at end of Service						
6. Business Relations, Effective Management, Effective Subcontracting Program						

Remarks on Entirely Favorable Performance: Provide data supporting this observation on separate page.

Remarks on Entirely Unfavorable Performance: Provide data supporting this observation on separate page.

***** Please refer to the attached page for Past Performance criteria for additional information on performance elements.

ADJECTIVE RATING	DESCRIPTION
Unacceptable	Past performance is unacceptable
Inadequate	Past performance more negative than positive
Marginal	No or neutral past performance
Acceptable	Past performance acceptable, more positive than negative
Good	Past performance acceptable in all areas/superior (good or outstanding) in several areas
Outstanding	Past performance acceptable in all areas/superior (good or outstanding) in most areas

PART IV - REPRESENTATIONS AND INSTRUCTIONS

SECTION K - REPRESENTATIONS, CERTIFICATIONS AND OTHER STATEMENTS OF OFFERORS

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K.1 ANNUAL REPRESENTATIONS AND CERTIFICATIONS (FAR 52.204-8) (JAN 2005)

(a) (1) If the clause at 52.204-7, Central Contractor Registration, is included in this solicitation, paragraph (b) of this provision applies.

(2) If the clause at 52.204-7 is not included in this solicitation, and the offeror is currently registered in CCR, and has completed the ORCA electronically, the offeror may choose to use paragraph (b) instead of completing the corresponding individual representations and certifications in the solicitation. The offeror shall indicate which option applies by checking one of the following boxes:

[ ] (i) Paragraph (b) applies.

[ ] (ii) Paragraph (b) does not apply and the offeror has completed the individual representations and certifications in the solicitation.

(b) The offeror has completed the annual representations and certifications electronically via the Online Representation and Certification Applications (ORCA) website at *http://orca.bpn.gov.* After reviewing the ORCA database information, the offeror verifies by submission of the offer that the representations and certifications currently posted electronically have been entered or updated within the last 12 months, are current, accurate, complete, and applicable to this solicitation (including the business size standard applicable to the NAICS code referenced for this solicitation), as of the date of this offer and are incorporated in this offer by reference (see FAR 4.1201; except for the changes identified below [*offeror to insert changes, identifying change by clause number, title, date].* These amended representation(s) and/or certification(s) are also incorporated in this offer and are current, accurate, and complete as of the date of this offer.

FAR Clause # Title Date Change

Any changes provided by the offeror are applicable to this solicitation only, and do not result in an update to the representations and certifications posted on ORCA.

K.2 CONTRACT ADMINISTRATION

Designate below the person(s) whom the Government may contact for prompt action on matters pertaining to administration of the contract.

NAME_____TITLE
TELEPHONE NUMBER: AREA CODE_____NUMBER_____EXT

K.3 CERTIFICATION

I hereby certify that the responses to the above Representations, Certifications and other statements are accurate and complete.

Signature: _____

Title : _____

Date : _____

SECTION L - INSTRUCTIONS, CONDITIONS, AND NOTICES TO OFFERORS

TABLE OF CONTENTS

L.1 SOLICITATION PROVISIONS INCORPORATED BY REFERENCE (FAR 52.252-1) (FEB 1998)

This solicitation incorporates one or more solicitation provisions by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. The Offeror is cautioned that the listed provisions may include blocks that must be completed by the Offeror and submitted with its quotation or offer. In lieu of submitting the full text of those provisions, the Offeror may identify the provision by paragraph identifier and provide the appropriate information with its quotation or offer. Also, the full text of a solicitation provision may be accessed electronically at this address: http://www.arnet.gov/far.

FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1)

NUMBER	DATE	TITLE
52.204-6	OCT 2003	DATA UNIVERSAL NUMBERING SYSTEM (DUNS) NUMBER
52.214-34	APR 1991	SUBMISSION OF OFFERS IN THE ENGLISH LANGUAGE
52.214-35	APR 1991	SUBMISSION OF OFFERS IN U.S. CURRENCY
52.215-1	JAN 2004	INSTRUCTIONS TO OFFERORS-COMPETITIVE ACQUISITIONS (ALTERNATES I AND II)
52.215-16	JUN 2003	FACILITIES CAPITAL COST OF MONEY
52.222-24	FEB 1999	PREAWARD ON-SITE EQUAL OPPORTUNITY COMPLIANCE REVIEW

L.2 REGULATORY NOTICE (CAR 1352.252-71) (MAR 2000)

Offerors are advised that certain provisions and clauses identified with a Commerce Acquisition Regulation (CAR) notation for identification purposes, have not yet been incorporated into the CAR. However, all of these items are binding for this acquisition and will eventually be contained in the CAR at Part 13 of Title 48 of the Code of Federal Regulations.

L.3 INQUIRIES (CAR 1352.215-73) (MAR 2000)

Offerors must submit all questions concerning this solicitation in writing to the Contracting Officer. **Questions submitted within 45 days after issuance of this solicitation shall be answered prior to the proposal due date. Any** Amendments issued and all responses to questions will be posted on both the Acquisition Management Division web site (http://www.rdc.noaa.gov/~amd/SOLINDEX.HTML) and the web site established specifically for this acquisition (http://rdhpcs.noaa.gov/ .

OFFERORS ARE INSTRUCTED SPECIFICALLY TO CONTACT ONLY THE PERSON CITED IN BLOCK 10 OF THE SF33 ABOUT ANY ASPECT OF THIS REQUIREMENT PRIOR TO CONTRACT AWARD.

Offerors may use the RDHPCS Q&A web site to contact the person cited in Block 10 of the SF33. The RFP Q&A URL is: http://rdhpcs.noaa.gov/

L.4 TYPE OF CONTRACT (FAR 52.216-1) (APR 1984)

The Government contemplates award of a fixed-price, lease contract resulting from this solicitation. Included in this Solicitation and resulting contract is an indefinite quantity option for support services. If required, these support services will be acquired on a labor-hour basis.

L.5 SUBMISSION OF OFFERS

(a) Markings: It is important that the outer envelope or wrapping of your offer be addressed as follows:

Offeror's return address

TO: SEE SPECIFIC ADDRESSES CITED BELOW

Solicitation No. DG1330-05-RP-1038
Closing Date: March 10, 2005
Closing Time: 12:00 PM local time

(b) HAND CARRIED OFFERS: Proposals hand carried must be delivered to the offices cited below (SEALED OFFERS ONLY). Hand carried offers must be delivered and contact must be made with the below offices by the date and time specified in this solicitation. Proposals received at the destination(s) after the date and time specified for receipt will be considered LATE and dealt with in accordance with the Late Proposals Provisions of paragraph (c)(3) of FAR 52.215-01, INSTRUCTIONS TO OFFERORS - COMPETITIVE ACQUISITION.

All proposals (offers) shall be submitted in the quantities and format specified below:

L.5.1 STANDARD FORM 33, SOLICITATION, OFFER, AND AWARD

The Standard Form 33, Solicitation, Offer, and Award, (SF 33) is being used for this solicitation. This form is used by the Government as a request for proposal and upon submission by the Offeror it becomes the Offeror's proposal. As such it is an offer which can be unilaterally accepted by the Contracting Officer and awarded on said SF 33. The offer and acceptance form the contract. Therefore, the following points must be strictly adhered to by the Offeror in submitting the proposal.

(a) The SF 33 must be executed by a representative of the Offeror authorized to commit the Offeror to contractual obligations. The authority to sign a proposal, but not an offer, subject to unilateral acceptance and award, is not sufficient authorization to sign the SF 33.

(b) UNDER NO CIRCUMSTANCES MAKE ALTERATIONS OR CHANGES TO THE SF 33 OR THE RELATED PAGES WHICH ARE A PART OF THE ENCLOSED REQUEST FOR PROPOSAL AND PROPOSAL PACKET. You are to complete those parts which require items such as prices, place of performance, etc., when such items are called for in the enclosed request for proposal. A place is provided for you to insert such information.

Three (3) originally executed (i.e., with original signatures) copies of the Standard Form of contract (SF 33) and one (1) copy of Section K fully executed shall be submitted to the following address:

Mail/UPS/FedEx Address and Hand Delivery Address

William L. Voitk, Contracting Officer
U. S. Department of Commerce/NOAA
Acquisition Management Division
1315 East-West Highway, Room 9734
Silver Spring, MD 20910

L.5.2 OFFEROR'S TECHNICAL PROPOSAL

The technical proposal shall be submitted in hard copies and, in addition, on ISO-9660 CDROM, formatted in Portable Document Format (PDF) format. Twelve (12) hard copies and twelve (12) machine readable

CDROM copies of the Offeror's technical proposal shall be submitted in the format prescribed in L.6.1 to the following address:

Mail/UPS/FedEx Address and Hand Delivery Address

William Turnbull, Director HPCC Office
U.S. Department of Commerce / NOAA
Office of the CIO, HPCC
1315 East-West Highway, Room 9600
Silver Spring, MD 20910

Two (2) copies of the Offeror's technical proposal (hard copy only) shall be submitted in the format prescribed in L.6.1 to the following address:

Mail/UPS/FedEx Address and Hand Delivery Address

William L. Voitk, Contracting Officer
U. S. Department of Commerce/NOAA
Acquisition Management Division
1315 East West Highway, Room 9734
Silver Spring, MD 20910

L.5.3 OFFEROR'S COST/PRICE PROPOSAL

The Cost/Price proposal shall be shall be submitted in hard copy and, in addition, on ISO-9660 CDROM, formatted in Portable Document Format (PDF) and or Microsoft Excel format. All financial tables submitted are required to be in Microsoft Excel format. Five (5) hard copies and ten (10) machine readable CDROM copies of the Offeror's Cost/Price Proposal shall be prepared in the format described in Section L.6.2 and Section B and submitted to the following address:

Mail/UPS/FedEx Address and Hand Delivery Address

William Turnbull, Director HPCC Office
U.S. Department of Commerce / NOAA
Office of the CIO, HPCC
1315 East-West Highway, Room 9600
Silver Spring, MD 20910

Two (2) hard copies and one machine readable CDROM copy of the Offeror's Cost/Price Proposal shall be submitted in the format prescribed in L.6.2 and Section B to the following address:

Mail/UPS/FedEx Address and Hand Delivery Address

William L. Voitk, Contracting Officer
U. S. Department of Commerce/NOAA
Acquisition Management Division
1315 East West Highway, Room 9734
Silver Spring, MD 20910

L.5.4 PAST PERFORMANCE

The information requested in L.6 PAST PERFORMANCE shall be submitted as follows:

Twelve (12) hard copies and one machine readable CDROM copies shall be submitted to the following address:

Mail/UPS/FedEx Address and Hand Delivery Address

William Turnbull, Director HPCC Office
U.S. Department of Commerce / NOAA
Office of the CIO, HPCC
1315 East-West Highway, Room 9600
Silver Spring, MD 20910

Two (2) copies of the Offeror's past performance (hard copy only) shall be submitted in the format prescribed in L.6.3 to the following address

Mail/UPS/FedEx Address and Hand Delivery Address

William L. Voitk, Contracting Officer
U. S. Department of Commerce/NOAA
Acquisition Management Division
1315 East West Highway, Room 9734
Silver Spring, MD 20910

L.5.5 OFFEROR'S FACILITY PROPOSAL

The facility proposal shall be submitted in hard copies and, in addition, on ISO-9660 CDROM, formatted in Portable Document Format (PDF) format. All financial tables submitted are required to be in Microsoft Excel format. Twelve (12) hard copies and twelve (12) machine readable CDROM copies of the Offeror's facility proposal shall be submitted in the format prescribed in L.8 to the following address:

Mail/UPS/FedEx Address and Hand Delivery Address

William Turnbull, Director HPCC Office
U.S. Department of Commerce / NOAA
Office of the CIO, HPCC
1315 East-West Highway, Room 9600
Silver Spring, MD 20910

Two (2) copies of the Offeror's facility proposal (hard copy only) shall be submitted in the format prescribed in L.8 to the following address:

Mail/UPS/FedEx Address and Hand Delivery Address

William L. Voitk, Contracting Officer
U. S. Department of Commerce/NOAA
Acquisition Management Division
1315 East West Highway, Room 9734
Silver Spring, MD 20910

L.5.6 SUBCONTRACTING PLAN

In accordance with FAR 52.219-9, SMALL BUSINESS SUBCONTRACTING PLAN (included in Section I.1 by reference), Offerors (large business concerns only) are required to submit a Small Business Subcontracting Plan. Reference L.15, SUBCONTRACTING SUPPORT IN ACCORDANCE WITH PUBLIC LAW 95-507, and L.16, HUBZONE SUBCONTRACTING GOALS, of this Section for applicable subcontracting goals. This Plan shall be included with the initial proposal and submitted to the following address:

Mail/UPS/FedEx Address and Hand Delivery Address

William L. Voitk, Contracting Officer
U. S. Department of Commerce/NOAA
Acquisition Management Division
1315 East West Highway, Room 9734
Silver Spring, MD 20910

L.5.7 LIVE TEST DEMONSTRATION

The Government will conduct pre-award Live Test Demonstrations (LTDs) to examine the components of the R&D HPCS that is being offered. **Only those Offerors within the competitive range (See M.1.2) will be scheduled for the LTD.** A LTD system hardware configuration very similar to the proposed R&D HPCS system configuration should be used. A LTD software configuration that is as close as possible to the proposed R&D HPCS configuration, excluding Government provided application codes, must be used and

documented. Offerors should clearly state any differences between the LTD hardware and software configurations and the proposed R&D HPCS configuration if the two are not identical. Additional consideration will be given if the LTD system, both hardware and software, is identical to the proposed initial system.

Requirements to be met during the LTD include (but are not limited to):

1) A demonstration of the performance levels of the proposed system in as much detail as possible.

2) A demonstration of the features of the architecture which support the extrapolation (if any) to the proposed system from the systems used in the LTD and to supply data for the RFP response.

3) Verification of the benchmark data presented in the RFP response.

4) Examination of the proposed interactive environment. After the performance data presented in the RFP response has been verified, a scripted interactive session will be run by itself and concurrently with benchmark codes to evaluate how well the interactive resources are isolated from the batch production workload.

5) A functional demonstration of the proposed Hierarchical Storage Management (HSM) software, separate from the timed benchmark demonstration. This demonstration must show the proposed HSM software in operation, and allow the Government to interact with the demonstration system. The proposed HSM hardware is not required for this demonstration but a limited hardware suite may add to the usefulness of this demonstration and aid in the evaluation of the software.

6) If a heterogeneous architecture is proposed, demonstrate the ability to run a set of workstreams across all the platforms.

One or more written problems will be presented regarding problem escalation procedures. The Offeror will be required to explain how they would handle the problem(s) as described.

The Government will allocate an Offeror two consecutive days for the LTD. NOAA expects its LTD work to take about six hours. At the discretion of the Government, the LTDs will take place at either the vendor's facility or at a Government facility. If the LTD is held at the vendor's facility the vendor must provide capabilities and resources to allow participation by remote Government personnel. The LTD will begin at 9:00 AM and end no later than 9:00 PM local time on the first day. If the Offeror is unable to successfully complete the LTD on the first day, the LTD will be repeated the second day. Should an Offeror successfully complete a portion(s) of the LTD on the first day, at the Government's discretion, the Offeror may be required to complete only the remaining or unsuccessful portion(s) the second day. If any portion of the LTD is performed on the second day, it will begin not earlier than 9:00 AM local time and will terminate before 3:00 PM. If the Offeror is unable to successfully complete the LTD on the second day, the Government will not provide another opportunity to successfully complete the LTD. Failure to successfully complete the LTD may, but will not necessarily, result in disqualification of the Offeror from further consideration. Such failure may also result in the downgrade of the Offeror's proposal.

L.6 PREPARATION OF PROPOSALS

Proposals shall be prepared and submitted as described below.

L.6.1 TECHNICAL PROPOSALS

The technical proposal must address all the elements in Section C, Statement of Need. The technical proposal will be used to evaluate an Offerors' ability to provide and perform the requirements detailed in Section C. Offerors should bear in mind that Risk will be assessed for all elements of the technical proposal.

The technical proposal must be organized with sections tabbed and arranged as described in L.6.1.1. The arrangement will follow the elements of Section C for the most part. The technical proposal, at the least, should describe the Offeror's response to the requirements contained in Section C. The technical proposal should include additional information the Offeror believes will more completely describe their ability to meet NOAA's needs.

The technical proposal must be prepared using the Times New Roman font in 12 point size for all text portions. It must be formatted to print double-sided on 8.5" by 11" paper with 1" margins on all sides. Page numbers must be printed in the bottom margin, centered, in the format "section - page", where section is the Section C section number, and page begins at 1 for each section. The requested hardcopies must be bound.

The technical proposal must use October 1, 2005, as the start of the R&D HPCS system life. Upgrades must be specified as "month/year. The acceptance test for each upgrade starts on the first day of the specified month.

The technical proposal must not exceed 100 pages in length (50 sheets of paper when printed double sided). The final revision of the technical proposal must be provided as a complete document, not as change pages. In addition, a change document must be provided in which all deleted text is marked with a "strikeout" (i.e., ~~strikeout~~) and added or modified text is yellow color-highlighted (i.e., yellow-color highlighted).

The technical proposal organization is provided below. Instructions are provided and Section C text has been paraphrased for the sake of brevity. Offerors must refer to Section C for the full text.

L.6.1.1 Technical Proposal Organization

TAB 1 PROCUREMENT OBJECTIVES

Demonstrate an understanding of NOAA's required period of performance for this contract as described in section C.1.

Demonstrate an understanding of NOAA's need for additional processing power to meet increasing mission requirements as described in section C.1.

Demonstrate your understanding of NOAA's need to acquire balanced, comprehensive computing capabilities in order to advance NOAA's research and development activities in environmental modeling as described in section C.1.

Demonstrate your understanding of NOAA's new approach for managing its HPC resources based on its functional requirements as described in C.1.

Explain how your proposed solution meets NOAA's current programmatic requirements, as represented by the funding profile presented in Table I in section C.4.3, and how your proposed solution can adapt to possible changes in these requirements.

TAB 2 BENCHMARKS

Describe how the benchmark requirements described in section C.4.2 will be achieved during the base contract period.. Include in the description a detailed plan for meeting the requirements for the initial deliveries for WS7 - WS9 that are required in Q1FY2006 and for the initial deliveries for WS1 - WS6 that are required in Q1FY2007. Include in the description a detailed plan for meeting the requirement for maximum System Life Throughput obtained by a significant mid-life upgrade that will not front-load or back-load performance. The mid-contract upgrades for WS1 – WS6 are desired to occur in Q2 or Q3FY2008. The mid-contract upgrades for WS7 – WS9 are desired to occur during Q4FY2007 or Q1FY2008. Follow the instructions that are described in Section J and use the spreadsheets that are provided for submitting benchmark results.

TAB 3 HPC SUB-SYSTEM COMPONENTS

Provide a high level system description of the proposed R&D HPCS that meets the requirements described in section C.5 for the base contract period. Describe system components, such as nodes and interconnect fabric, and the overall architecture of the system with particular attention to performance and system dependability. Describe design aspects that maximize performance such as different node types, memory distribution, etc. Include diagrams and specifications of all major sub-system components. Include in the description the rationale used to select the various brand components that comprise the proposed HPCS. List the various brand components that were considered along with any performance specifications or test results that were used in the selection of the proposed HPCS. Describe if the Offeror will provide the Government with any pre-delivery access to the system and how it will be implemented.

TAB 3.1 Large Scale Computing Component (LSC)
Describe how the proposed LSC will meet the requirements described in section C.5.1.1 for the base contract period . Include in this description the calculation used to compute the system life throughput for the LSC.

TAB 3.2 Development Component
Describe how the proposed developmental component will meet the requirements described in section C.5.1.2 for the base contract period.

TAB 3.3 Post Processing and Analysis Component
Describe how the proposed post processing and analysis component will meet the requirements described in section C.5.1.3 for the base contract period.

TAB 3.4 Data Management Requirement
Describe how the proposed system will provide data integrity and provide at least 99% availability for data access as required in section C.5.2 for the base contract period.

TAB 3.4.1 Home File System (HFS)
Describe how the proposed HFS will meet the requirements described in section C.5.2.1 for the base contract period.

TAB 3.4.2 Fast Scratch File System (FSFS)
Describe how the proposed FSFS will meet the requirements described in section C.5.2.2 for the base contract period.

TAB 3.4.3 Long Term Scratch File System (LTSFS)
Describe how the proposed LTSFS will meet the requirements described in section C.5.2.3 for the base contract period.

TAB 3.4.4 Hierarchical Storage Management System (HSM)
Describe how the proposed HSMS will meet the requirements described in section C.5.2.4 for the base contract period. Include in the description such things as: how the HSMS software searches for archived files on a tape, if the tape drive's fast-search features will be used, show a calculation of the aggregate tape positioning rate for small frequently used files, and a calculation for the large files in the near-line tier, describe the process or mechanism for identifying tapes that have become broken, describe the process for recovering data from tapes that have been physically damaged and how the legacy archived will be addressed.

TAB 3.4.5 Interfaces to the NOAA Operational Central Computer System (OCCS) and the Backup OCCS

Describe how the proposed solution will meet the interface requirements described in section C.5.2.5.

TAB 3.4.6 Data Generation Profile
Describe how the proposed data management system will be able to support the data volumes detailed in sections C.5.2.6.1and C.5.2.6.2 for each workstream and section C.5.2.6.3 for the OCCS and the OCC backup for the base contract period

TAB 3.4.7 Data Retention Profile
Describe how the proposed data management system will be able to support the data volumes detailed in Table III in section C.5.2.7 for the base contract period.

TAB 3.4.8 Automated Backup
Describe the hardware, software, and process the will be used to meet the requirements in section C.5.2.8 for the base contract period.

TAB 4 SOFTWARE REQUIREMENTS

TAB 4.1 Resource Management Software
Describe the software that will be implemented to meet the requirements in section C.5.3.1 for the base contract period. Indicate whether or not any of the desired features that are mention in this section will also be met with this solution. Include a description of how the software is licensed.

TAB 4.2 Batch Queuing Software

Describe the software that will be implemented to meet the requirements in section C.5.3.2 for the base contract period. Indicate whether or not any of the desired features that are mention in this section will also be met with this solution.

TAB 4.3 Programming Environment Software
Describe how the software listed in section C.5.3.3 will be provided and provisioned across the R&D HPCS for the base contract period . Include a description of how the software will be licensed.

TAB 4.4 COTS
Describe how the software listed in section C.5.3.4 will be provided and provisioned across the R&D HPCS. Include a description of how the software will be licensed for the base contract period.

TAB 4.5 Community Supported Software
Describe how the software listed in section C.5.3.5 will be provided and provisioned across the R&D HPCS. Include a description of how the software will be licensed for the base contract period.

TAB 4.6 Proposed Software
If the proposal contains any software that was not specifically required, the Offeror will provide information pertaining to the installed base of any such software.

TAB 4.7 System Software
Describe how node operating system (OS) upgrades will affect application programs and job scripts. Describe the expected impact of upgrades of the OS on libraries pertaining to numerical results with respect to object files. Describe how OS upgrades will be managed. Describe the resources that will be used to test OS and application software upgrades. If checkpoint/restart capabilities are offered, describe what is being provided and how it will work.

TAB 5 NETWORK REQUIREMENTS

Provide a description and diagram(s) of the proposed network architecture that will be implemented to meet the requirements in section C.5.4 for the base contract period . Include expected data transfer rates and expected response times. The proposal should clearly indicate how the requirements for data browsing, interactive debugging and file editing at the required frame rates per second and quality of service will be met. Describe how the proposed network solution will meet the needs of the categories of users at each of their locations described in section C.5.4.1.

TAB 5.1 User Profile

TAB 5.1.1 User profile for WS7-WS9
Describe how the network architecture being proposed will meet the requirements described in section C.5.4.1.1 for the base contract period.

TAB 5.1.2 User profile for WS4-WS6
Describe how the network architecture being proposed will meet the requirements described in section C.5.4.1.2 for the base contract period.

TAB 5.1.3 User profile for WS1-WS3
Describe how the network architecture being proposed will meet the requirements described in section C.5.4.1.3 for the base contract period .

TAB 5.2 Wide Area Network Component
Describe any additional connectivity that is being provided as a part of the proposed solution in order to meet the requirements in section C.5.4.2. If not already included in the response to Tab 5, provide network diagrams and specifications.

TAB 5.3 Describe how remote users will access the R&D HPCS and specify expected response times that a typical remote user might experience during a typical interactive session.

TAB 5.4 High bandwidth connectivity to model and observation data
Describe how the proposed solution will deliver the data described in section C.5.4.3 to the appropriate works streams. If not already included, provide diagrams and specifications of any additional network resources that the Offeror is providing to meet this requirement

TAB 5.5 Communications Requirements to Support the HSMS
Describe how the proposed solution will meet the requirement described in section C.5.4.4.

TAB 6 IT SECURITY

Describe the IT security hardware, software, and procedures that will be incorporated into the design of the proposed system that meet the requirements of section C.5.5 for the base contract period. Provide diagrams and specifications of all equipment that is proposed.

TAB 7 RELIABILITY AND AVAILABILITY REQUIREMENTS

During the base contract period describe how the Offeror will provide support for the requirements in section C.6.1.

TAB 7.1 Downtime
Describe your understanding of what constitutes downtime and the elements described in section C.6.1.1.

TAB 7.2 Availability
Provide the proposed Availability number. Describe your understanding of how availability will be measured as described in section C.6.1.2. Include in the description any tools and technologies that will be implemented to meet and monitor the availability.

Provide a table that shows the system life throughput for each workstream for each year of the base period of the contract.

TAB 8 SUPPORT SERVICES REQUIREMENTS

TAB 8.1 Support
Describe your support structure that will be implemented to meet the 96% system availability as described in section C.7.1 for the base contract period.

TAB 8.2 Training
Describe how the training requirements listed in section C.7.2 will be met for the base contract period.

TAB 9 PROJECT MANAGEMENT REQUIREMENTS

Give a brief description of how the project is to be organized, staffed, and managed, identifying all subcontractors that meet the requirements stated in section C.8.1. Include in the description the number of software engineers, hardware engineers, and applications analysts proposed, and describe their qualifications and duties.

TAB 9.1 Transition to "One NOAA"
NOAA requires the Offeror to provide a transition plan over the term of the base period of this contract to move NOAA from its current organization-based business processes toward the "One NOAA" approach identified in section C.8.2. The transition plan will identify the approach proposed to be followed; the various components to be used; the phasing of the various components; the testing plan; and the final state of the transition at the end of the base period. The vendor will include use cases describing how the user will work at the various phases of the implementation of the integration. In proposing a solution, the vendor shall identify the costs and the performance trade-offs necessary to implement the solution.

TAB 9.2 Documentation
Provide a description of how the Offeror proposes to provide the various documents described in section C.8.3.

TAB 9.3 Configuration and Change Management Plan
Provide a detailed description of how the configuration management and any associated change processes for the R&D HPCS will be maintained over the life of the contract as described in section C.8.4.

TAB 9.4 Transition Requirements
Provide a detailed description and plan covering the transition period from the three existing contracts to this new contract. In addition, describe how the requirements in section C.8.5 will be met.

TAB 10 CONTRACT OPTIONS

TAB 10.1 Option period
The Offeror should describe their approach for meeting the requirements for the four year option period (FY2010 – FY2013) described in section C.9.1. Describe how the approach will address maximizing the system life throughput of the workstreams.

TAB 10.2 One year option

The Offeror should describe their approach for meeting the requirements for the one year option period described in sections C.9.2 (FY2010) and C.9.3 (FY2014).

TAB 10.3 Additional R&D HPCS Augmentations
Describe how the Offeror will meet the requirements described in section C.9.4 utilizing an ID/IQ mechanism.

TAB 10.4 Engineering Support
Describe how the Offeror will provide the engineering support as described in section C.9.5 utilizing an ID/IQ mechanism.
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TAB 11 EXCEPTIONS

List all exceptions taken to the Government's requirements, giving the Offeror's rationale for each exception.

TAB 12 OFFEROR QUALIFICATIONS

Give a brief description of the Offeror addressing the qualifications, experience, and corporate resources that allow the Offeror to satisfy the Government's requirements.

L.6.2 COST PROPOSALS

L.6.2.1 Offerors are required to provide detailed pricing proposals that include all cost elements by month (e.g., lease cost, hardware maintenance, software maintenance, on-site support, etc.) for the base period of the contract. Offerors are required to submit separate pages for each contract year depicting all costs. If alternate methods of acquisition are proposed, a separate proposal for each acquisition method must be submitted.

L.6.2.2 The Offeror is required to include the following in its cost/price proposal:

A.Price for hardware by item.

B. Price for software. Provide monthly pricing for each item of software offered. Indicate if it is leased software or purchased software.

C. A breakout by labor category of all services proposed (e.g., hardware, maintenance, software maintenance, on-site applications analyst, etc.) and total price for each item. A separate breakout is required for each year of the base contract period.

D. A detailed description and breakout of any other price proposed (e.g. communications, power, cooling, etc.)

E. Separate pricing for all of the options described in section C.9.

L.6.2.3 If proposed, cost information for each subcontractor and consultant shall be furnished in the same format and level of detail as prescribed for the prime Offeror. Additionally, the Offeror shall submit the following information:

1.A description of the items to be furnished by the subcontractor.

2.Identification of the proposed subcontractor and an explanation of why and how the proposed subcontractor was selected including the extent of competition obtained.

3.The proposed subcontract price, the Offeror's cost or price analysis thereof, and performance/delivery schedule.

4.Identification of the type of subcontract to be used.

L.6.2.4 Offerors are not required to submit certified cost or pricing data with their cost proposal. Full- and-open competition will be used to determine prices fair and reasonable. However, Offerors may be requested to provide additional information in the event prices appear over-stated or under-stated.

L.6.2.5 Funding Profiles

Table I shows anticipated total available funding in $ millions for the contract years

	Base Period				*Option Period*				*One-Year Options*
Fiscal Years	2006	2007	2008	2009	2010	2011	2012	2013	2010/2014
Contract Years (Base and Options)	$3	$22.8	$22.8	$22.8	$22.8	$22.8	$22.8	$22.8	$11.4

Table II shows total funding in $ millions minus the 6% reserve for the contract years

	Base Period				*Option Period*				*One-Year Options*
Fiscal Years	2006	2007	2008	2009	2010	2011	2012	2013	2014
Contract Years (Base and Options)	$2.82	$21.43	$21.43	$21.43	$21.43	$21.43	$21.43	$21.43	$10.72

Table III shows the expected funding ceilings in $ millions for the Contract Augmentation and Engineering support Options

Fiscal Years	2006	2007	2008	2009	2010	2011	2012	2013	2014
Contract Augmentations and Engineering Support	$23.34	$23.34	$23.34	$23.34	$23.34	$23.34	$23.34	$23.34	$10.7.2

Offerors are required to submit cost/price proposals based upon Tables II and III. Table II covers the base contract period, the four year option period, and the one year contract transition period. Table III contains funding that Government may put on the contract for additional R&D HPCS Augmentations (C.9.4) and Engineering support (C.9.5).

L.6.2.6 As stated in Section B, the Government anticipates leasing the equipment during the base contract period and the option contract period. However, the Government will acquire ownership of the Hierarchical Storage Management System (HSMS) upon delivery, acceptance, and payment. The Government requires delivery of the HSMS during the initial year of the base contract period, and the initial year of the option contract period, should the option be exercised. Multiple deliveries of storage media may be provided over the term of the contract. The storage media will become Government property upon delivery, acceptance, and payment.

Any lease resulting from this Solicitation must be determined an "operating lease" in accordance with the policies set forth in Office of Management and Budget (OMB) Circular A-11 and the Federal Accounting Standards Advisory Board (FASAB). Accordingly, offerors are required to submit the following pricing information for the base contract period:

1. monthly lease price by component
2. monthly lease price for each software package
3. monthly maintenance price for leased hardware and software
4. monthly price associated with taxes
5. monthly price associated with insurance
6. monthly facilities rental (if applicable)
7. Communication costs (if applicable)
8. Power and cooling costs
9. Interest rate used to calculate lease payments.

L.6.2.7 In addition, offerors shall provide the fair market value (FMV) price for each proposed hardware component and software package and the basis for the FMV (e.g., GSA Federal Supply Schedule price, published commercial price, etc.)

L.6.3 PAST PERFORMANCE

In this section, the Offeror shall describe its capabilities (and those of its subcontractors and consultants, if any), and provide its experience with at least five (5) and no more than seven (7) **relevant** contracts of a similar nature and magnitude within the past three (3) years. The Offeror shall discuss how its previous experience prepares it to undertake a contract of the scope envisioned in this solicitation. The Offeror must provide information to assist the Government in assessing its ability to perform the contract as proposed.

References other than those identified by the Offeror may be contacted by the Government with the information received used in evaluating the Offeror's past performance.

The "Performance Evaluation Report" format is required by the Government to report this information.

Past Performance Report

Procurement Activity and address
Contracting Officer Name
Contracting Officer Telephone Number
Contracting Officer Address
Technical Point of Contact Name (must possess specialized technical knowledge of the high-performance computing components acquired.)
Technical Point of Contact Telephone Number
Technical Point of Contact Address
Type of Contract
Award Price
Final Price
Award Date

Description of Experience

L.7 COST REALISM

An offer is presumed to represent an Offeror's best efforts to respond to the solicitation. Any inconsistency, whether real or apparent, between promised performance and cost or price, should be explained in the proposal. For example, if the intended use of new and innovative production techniques is the basis for an abnormally low estimate, the nature of these techniques and their impact on cost/price should be explained; or, if a business policy decision has been made to absorb a portion of the estimated cost, that should be stated in the proposal. Any significant inconsistency, if unexplained, may raise a fundamental issue of understanding of the nature and scope of the work required and of the Offeror's financial ability to perform the contract, and may be grounds for rejection of the offer. The burden of proof as to cost credibility rests with the Offeror.

L.8 FACILITY PROPOSAL

The Offeror will submit a facility proposal that consists of facility sub-proposals for each site that is proposed. The facility proposal must be prepared using the Times New Roman font in 12 point size for all text portions. It must be formatted to print double-sided on 8.5” by 11” paper with 1” margins on all sides. Page numbers must be printed in the bottom margin, centered, in the format “section - page”, where section is the Section C section number, and page begins at 1 for each section. The requested hardcopies must be bound.

Each facility sub-proposal must not exceed 30 pages in length (15 sheets of paper when printed double sided) for each site that is proposed (e.g., the facility proposal for one Government-provided site and one Contractor-provided site must not exceed 60 pages in total length). Contractors must provide any mechanical drawings in electronic format as AutoCad files on a CD-Rom as well as in the same 8.5” by 11” hardcopy format as above in an Appendix to their proposal; the hardcopy pages in these Appendices will not be counted in the 30-page limit per site. The final revision of the facility proposal must be provided as a complete document, not as change pages. In addition, a change document must be provided in which all deleted text is marked with a “strikeout” (i.e., ~~strikeout~~) and added or modified text is yellow color-highlighted (i.e., yellow-color highlighted).

Provide a facility proposal that meets the requirements described in section C.5.6.

If any of the Government-provided facilities described in Section C.11 are to be used, the Contractor must provide the following for each facility:

1) A detailed site-preparation plan that prescribes facility modifications, with schedule, that are required for initial equipment installation and any subsequent equipment transitions during the base contract. Contractors that propose to use LARGO, BLDR-1 and/or BLDR-2 must provide a detailed description of site modifications, including cost estimate, so that credits can be provided to the Government for work to be completed by GSA contractors.
2) A plan indicating expected usage of facility resources (e.g., raised floor space, peak power load, peak cooling load) as a function of time throughout the base contract
3) Identification of any additional resources required by the Contractor's proposal that are above those projected by the Government to be available and a plan indicating how these resources would be obtained
4) Equipment characteristics of each major component, including:
    - Equipment dimensions, weight, and quantity
    - Cooling requirements and cooling design
    - Power requirements and power distribution design
5) Analysis of each proposed system configuration to demonstrate sufficient UPS capacity graceful system shutdown
6) Identification of any site-restricted GFE equipment that the Contractor proposes to use, including any refurbishment or enhancement that is needed
7) Identification of any unrestricted GFE equipment from another Government site that the Contractor proposes to use. Proposed shipping arrangements should be identified, including procedures for its return at the end of the contract.
8) Any additional facility enhancements, with implementation plan, that the Contractor proposes in order to assure robust operation

If any Contractor-provided facility is proposed, the Contractor must provide the following in the facility proposal:

1) A copy of the site operating plan, including facility management procedures
2) A copy of the physical security procedures
3) A statement of how NOAA remote computer operators would be informed of deteriorating facility conditions such as rising room temperatures or an air handler failure
4) A copy of the facility's disaster recovery plan
5) One-line (logic) diagrams of the electrical service and cooling service
6) An energy density (watts per square foot) projection plotted over the contract life
7) A spreadsheet listing the type and age of facility equipment to be used. Examples are: UPS systems and power conditioners, chillers, heat exchangers, air handlers
8) A copy of the contract statement of work for any commercial facility management company used, or the equivalent if performed in-house. Preventative maintenance schedules, proactive inspections, and quality assurance methods are examples
9) A brief (2-3 paragraphs) description of the procedures used to acquire off-site emergency service, including minimum response times and escalation procedures
10) A statement (one paragraph) as to how coverage and services are made available after-hours and on holidays
11) A statement (paragraph) projecting the minimum UPS power protection period (survival time) that is required, when utility power fails, in order to assure graceful system shutdown. Also provide a maintenance schedule on UPS systems that would address any UPS deterioration.
12) A brief description of the fire protection systems and certification standards

13) A brief description of any automated facility controls such as computer-managed failover systems
14) A bio (curriculum vitae) of the facility manager's experience and training
15) A description of facility alterations and changes to be made to the offered space if the Offeror is successful
16) A list of all unrestricted Government furnished equipment to be used, including a schedule for shipment to the site and procedures for its return at the end of the contract

The Government reserves the right to conduct site visits of all proposed Contractor-provided facilities during the procurement evaluation. During the site visit, the Government may inspect:

1) Mechanical rooms
2) Raised floor plenums, drainage, cable tracks, labeling, and management
3) Network cabling protection and redundancy provisions
4) Power and cooling distribution and control systems
5) Logs of equipment failures, corrective actions taken and maintenance results
6) Preventive maintenance schedules
7) Emergency plans, and results of drills
8) Testing procedures and schedules
9) Training provided to facility managers, maintenance and physical security personnel
10) Safety and fire protection equipment and operation
11) Any other relevant materials that will enable the government to assess the reliability and safety of the facility

L.9 DRAWINGS AND VISIT TO GOVERNMENT-PROVIDED FACILITIES

The Government offers all interested Offerors the following opportunities for obtaining additional information about the Government-provided facilities that are described in Section C.11:

Request for Facility Drawings

Interested Offerors may obtain a copy of available facility drawings for these facilities by downloading the designated forms located on the public website and completing the forms, including signature of an authorized official of the company. Contractors must send these completed forms (which include GSA Document Security Order PBS 3490.1) for the GSA-controlled facilities, BLDR-1, BLDR-2, and LARGO and other forms, as specified at the website, http://rdhpcs.noaa.gov, for the Princeton and Fairmont facilities) to the following address for receipt no later than close of business (COB) on Friday, January 21, 2005:

Mail/UPS/FedEx Address and Hand Delivery Address

William L. Voitk, Contracting Officer
U. S. Department of Commerce/NOAA
Acquisition Management Division
1315 East West Highway, Room 9734
Silver Spring, MD 20910

Procedures for obtaining facility drawings for Princeton and Fairmont are indicated at the following web site: http://rdhpcs.noaa.gov

Visit to Proposed Facilities

Offerors may send designated Contractor personnel to attend meetings on the following dates and times in order to tour the five facilities and to ask facility questions that are relevant to the sites being toured:

Princeton, NJ (PRTN).....February 15, 2005 at 10:00 AM EST
Largo, MD (LARGO)……. .....February 16, 2005 at 10:00 AM EST
Fairmont, WV .....February 17, 2005 at 1:00 PM EST
Boulder, CO (BLDR-1 and BLDR-2).....February 22, 2005 at 10:00 AM MST

The Government will make every effort to answer all appropriate questions posed by Contractor personnel during the visit or as follow-up questions and answers posted on the Q&A public website.

In order to meet its physical security requirements for background checks, the Government requires Contractors to complete and submit the forms provided on the website, http://rdhpcs.noaa.gov, for each site to be visited. These forms, which will be needed to complete background checks of all designated personnel that expect to attend these site visits, must be received by the Government at the above address no later than January 21, 2005. The Government reserves the right to deny admission for any personnel that fail to pass the Government's background check.

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L.10 PRE-AWARD SURVEY

The Government reserves the right for a survey team to visit the Offeror's facility(s) for the purpose of determining the technical and financial ability to perform. A current financial statement and other data pertinent to this purpose should be available at the time the team makes the visit. The team will also consider the technical and financial ability of proposed subcontractors. Examples of the type of technical, financial and other capability matters the team will-evaluate are (1) past experience with firm, (2) financial strength, (3) facilities, (4) ability to meet required delivery schedule, (5) subcontracting, (6) manpower availability and labor relations, (7) management controls and (8) any other areas pertinent to this offer.

L.11 ACCEPTANCE OF PROPOSALS

The Government reserves the right:

1. To consider as acceptable only those proposals submitted in accordance with all technical requirements set forth or referenced in this solicitation and which demonstrate an understanding of the problems involved and the scope of the project.

2. To reject, as unacceptable, proposals deleting or altering technical requirements which are considered by the Government not to be beyond the state of the art nor impossible to attain.

L.12 UNACCEPTABLE OFFER TRANSMISSION METHODS

Submission of telegraphic (including mailgrams), telefax, or e-mail offers are not authorized.

L.13 AMENDMENTS TO PROPOSALS

Any changes to a proposal made by the Offeror after its initial submittal shall be accomplished by replacement pages. Changes from the original page shall be indicated on the outside margin by vertical lines adjacent to the change. The Offeror shall include the date of the amendment on the lower right corner of the changed pages.

L.14 FINAL PROPOSAL REVISION

Upon completion of negotiations, all Offerors still within the competitive range will be requested to submit a final proposal revision. Following evaluation of final proposal revisions, the Offeror whose proposal is most advantageous to the Government, considering the evaluation factors specified in Section M, will be selected for contract award.

L.15 SUBCONTRACTING SUPPORT IN ACCORDANCE WITH PUBLIC LAW 95-507

(a) Small and small disadvantaged businesses are encouraged to participate as prime contractors or as members of joint ventures with other small businesses. All interested contractors are reminded that the successful contractor will be expected to place subcontracts to the maximum practicable extent with small and small disadvantaged firms in accordance with the provisions of Public Law 95-507 and Subpart 19.7 of the Federal Acquisition Regulation.

(b) The following are the minimum goals for this acquisition:
1. Subcontracts to small business firms ---- 15.0%
2. Subcontracts to minority-owned firms ---10.0%
3. Subcontracts to women-owned businesses --- 3.0%
4. Subcontracts to disabled veteran-owned business ---1%

These goals are considered to be minimum goals for NOAA's subcontracts not ceiling goals or maximum goals.

L.16 HUBZONE SUBCONTRACTING GOALS

(A) The Historically Underutilized Business Zones (HUBZones) Act of 1997 created the HUBZone Program. The purpose of this program is to provide federal contracting assistance for qualified small business concerns located in historically underutilized business zones in an effort to increase employment opportunities, investments, and economic development in these areas. Only those contractors listed on the Small Business Administration's PRO-Net site (http://www.sba.gov) at the

time of contract award are qualified HUBZone contractors and can be considered by contractors in meeting their HUBZone small business subcontracting goals.

(B) The HUBZone goals established for the Department of Commerce are as follows:

1. FY2006 - 3% of the total value of the prime contract
2. FY2007 and subsequent years - 3.0% of the total value of the prime contract

L.17 INCURRING COSTS

The Government is not liable for any costs incurred by Offerors in submitting offers in response to this solicitation. Proposal costs may be included in an Offeror's indirect rates as appropriate.

L.18 SERVICE OF PROTEST (FAR 52.233-2) (AUG 1996)

(a) Protests, as defined in 33.101 of the Federal Acquisition Regulation, that are filed directly with an agency, and copies of any protests that are filed with the General Accounting Office (GAO) shall be served on the Contracting Officer (addressed as follows) by obtaining written and dated acknowledgment of receipt from:

William L. Voitk, Contracting Officer
U. S. Department of Commerce/NOAA
Acquisition Management Division
1315 East West Highway, Room 9734
Silver Spring, MD 20910

(b) The copy of any protest shall be received in the office designated above within one day of filing a protest with the GAO.

L.19 ADDITIONAL REQUIREMENTS FOR SERVICE OF PROTEST

In addition to the above, protests shall also be served on the Contract Law Division of the Office of the Assistant General Counsel for Finance and Litigation located at:

U.S. Department of Commerce
Contract Law Division
Office of the General Counsel
Herbert C. Hoover Building, Room H5893
14th Street, N.W.and Constitution Avenue, N.W.
Washington, D.C. 20230
ATTN: Mark Langstein
FAX (202) 482-5858

L.20 DEPARTMENT OF COMMERCE - SERVICE OF PROTESTS (CAR 1352.233-71) (MAR 2000)

An agency protest may be filed with either (1) the Contracting Officer, or (2) at a level above the Contracting Officer, with the agency Protest Decision Authority. See 64 Fed. Reg. 16,651 (April 6, 1999) (Internet site: http://oamweb.osec.doc.gov/docs/car13.htm#car13) for the procedures for filing agency protests at the level above the Contracting Officer (with the Protest Decision Authority).

Agency protests filed with the Contracting Officer shall be sent to the following address:

William L. Voitk, Contracting Officer
U. S. Department of Commerce/NOAA
Acquisition Management Division
1315 East West Highway, Room 9734
Silver Spring, MD 20910

If a protest is filed with either the Protest Decision Authority, or with the General Accounting Office (GAO), a complete copy of the protest (including all attachments) shall be served upon both the Contracting Officer and Contract Law Division of the Office of the General Counsel within one day of filing with the Protest Decision Authority or with GAO. Service upon the Contract Law Division shall be made, as follows:

U.S. Department of Commerce
Office of the General Counsel
Contract Law Division--Room 5893
Herbert C. Hoover Building
14th Street and Constitution Avenue, N.W.
Washington, D.C. 20230.
Attn: Mark Langstein
FAX: (202) 482-5858

L.21 INVITATION TO PROPOSE FINANCING TERMS (FAR 52.232-31)(OCT 1995)

(a) The Offeror is invited to propose terms under which the Government shall make contract financing payments during contract performance. The financing terms proposed by the Offeror shall be a factor in the evaluation of the Offeror's proposal. The financing terms of the successful Offeror and the clause, Terms for Financing of Purchases of Commercial Items, at FAR 52.232-29, shall be incorporated in any resulting contract.
(b) The Offeror agrees that in the event of any conflict between the terms proposed by the Offeror and the terms in the clause at Terms for Financing of Purchases of Commercial Items, at FAR 52.232-29, the terms of the clause at 52.232-29 shall govern.
(c) Because of statutory limitations (10 U.S.C. 2307(f) and 41 U.S.C. 255(f)), the Offeror's proposed financing shall not be accepted if it does not conform to the following limitations:

(1) Delivery payments shall be made only for supplies delivered and accepted, or services rendered and accepted in accordance with the payment terms of this contract;
(2) Contract financing payments shall not exceed 15 percent of the contract price in advance of any performance of work under the contract;

(3) The terms and conditions of the contract financing must be appropriate and customary in the commercial marketplace; and
(4) The terms and conditions of the contract financing must be in the best interest of the United States.

(d) The Offeror's proposal of financing terms shall include the following:
(1) The proposed contractual language describing the contract financing (see FAR 32.202-2 for appropriate definitions of types of payments); and
(2) A listing of the earliest date and greatest amount at which each contract financing payment may be payable and the amount of each delivery payment. Any resulting contract shall provide that no contract financing payment shall be made at any earlier date or in a greater amount than shown in the Offeror's listing.

(e) The Offeror's proposed prices and financing terms shall be evaluated to determine the cost to the United States of the proposal using the interest rate and delivery scheduled specified elsewhere in this solicitation.

L.22 NOTICE TO OFFERORS

This Solicitation is issued pursuant to a U.S. Department of Commerce Concept of Operations (CONOPS) Project Agreement. The full text of the Project Agreement for this acquisition is located at the following web site: http://rdhpcs.noaa.gov/

L.23 ALTERNATE PROPOSALS

Offerors may submit more than one proposal, as long as one proposal satisfies all of the mandatory requirements of the solicitation. As a minimum, one of the proposals submitted must be complete. The alternate proposal(s) may be in an abbreviated form following the same section format, but providing only those sections which differ in any way from those contained in the original proposal. Each proposal will include cost tables indicating the complete range of pricing options. In the case of price/cost options for a given configuration, an alternate proposal will not be required. If alternate proposals are submitted, such alternatives will be clearly labeled and identified on the cover page of each separate document. The reason for each alternate and its comparative benefits shall be explained. Each proposal submitted will be evaluated on its own merits. Alternate proposals may be no more than 100 pages in length.

Alternate proposals may be submitted within 30 calendar days from the proposal closing date and time specified in L.5, SUBMISSION OF OFFERS. Alternate proposals received during this 30 day period will only be accepted if the primary proposal was received by the closing date and time specified.

M: EVALUATION FACTORS FOR AWARD

M.1 GENERAL EVALUATION INFORMATION

Careful, full and impartial consideration will be given to offers received pursuant to this solicitation. Only Offerors which demonstrate acceptable submission to the Government of all items included in Section L of this solicitation (or amendments thereof) will be considered for award. This includes:

- Submitting a proposal that meets all minimum requirements.
- Submitting a proposal that complies with all requirements of law, regulation, and conditions set forth in the solicitation.
- Submitting a proposal that meets all technical requirements and specifications of the solicitation.

In evaluating all areas of an Offeror's proposal, the Government may consider risk. Risk may affect the Summary Rating of the Technical and Past Performance proposals.

A Glossary of Terms used in this document can be found in Section C, Appendix D of this Request For Proposal (RFP).

M.1.1 Minimum Requirements

Proposals that fail to meet any of the Requirements cited in Section C will be considered unacceptable.

M.1.2 Competitive Range

The Contracting Officer will make the determination as to which offers are in the "Competitive Range." The Competitive Range shall be comprised of all the most highly-rated proposals unless the range is further reduced for purposes of efficiency pursuant to FAR 15.306(c) (2). All Offerors in the competitive range will be invited to participate in the live test demonstration (LTD). The initial number of offers considered as being within the competitive range may be reduced when, as a result of the written or oral discussions, or LTD, an offer has been determined to no longer have a reasonable chance of being selected for award. Offerors that do not have an adequate facilities proposal will not be in the competitive range.

M.1.3 Discussion/ Final Proposal Revision

All Offerors selected to participate in discussions will be advised of deficiencies, serious weaknesses, and other aspects whose remedying might materially enhance their proposal, as well as negative comments concerning past performance. Offerors will be presented a reasonable opportunity to revise price and technical parts of their proposal accordingly and to address unfavorable reports of past performance. A final common cut-off date

which allows a reasonable opportunity for submission of written responses to discussion issues shall be established, and those Offerors remaining in the competitive range will be notified to submit a final proposal revision.

M.1.4 Responsibility

An offeror must be determined responsible according to the standards in FAR Subpart 9.1, RESPONSIBLE PROSPECTIVE CONTRACTORS

M.1.5 Evaluation of Options

Optional Periods of Performance

The performance levels offered for the HPCS will be the only factors used in the Technical Evaluation to evaluate the solution proposed for the option periods. However, in constructing proposals, Offerors must assume that overall system dependability and balance among the HPCS components will be maintained, within the confines of the funding profile, during the option periods. Evaluation of options will not obligate the Government to exercise options(s).

- One-year extension of Base Period, maintenance and related support services. The factors used to evaluate this option are the price and the strategy used to transition the HPCS into the follow-on system.

- Optional four year extension of the Base Period, known as the “Option Period”. The Option Period will continue to provide the computational and associated resources necessary to support continued advances in environmental modeling capabilities and other high-performance computing system requirements that may arise within NOAA and at other partner agencies.

- One-year extension of Option Period, maintenance and related support services. The factors used to evaluate this option are the price and the strategy used to transition the HPCS into the follow-on system.

- Additional R&D HPCS Augmentations: These additional augmentations could be used to satisfy unanticipated NOAA requirements or requirements from a partnering agency.

- Engineering Support: The factors used to evaluate this option are price, credibility, and recruitment strategies.

M.2 EVALUATION OF PROPOSALS

To be acceptable and eligible for evaluation, proposals must be prepared in accordance with, and comply with, the instructions given in this solicitation document and must meet the specifications and requirements set forth in Section C. Proposals meeting the minimum requirements and complying with the provisions of the Standard Form of Contract will be evaluated in accordance with the procedures described herein and award

made to the responsible Offeror whose proposal is determined to be the most advantageous to the Government.

All proposals will be evaluated based on the technical, past performance, price factors, and facilities described in this section. Proposals will be evaluated with a view toward the award of the contract presenting the most favorable offer to the Government, therefore, proposals must contain such information as may be required to conduct a detailed and thorough evaluation.

The Offeror's proposal must give clear, detailed information sufficient to enable evaluation based on the major factors and subfactors listed below.

Major factors considered in the evaluation of offers are as follows:

- **Technical:** This factor will receive a narrative description and will be rated higher than Past Performance and Price. **For all Offerors in the competitive range, the Live Test Demonstration will affect the rating of this factor.**

- **Past Performance:** The Offeror's proposal will receive a rating based on documented information regarding such factors as quality, timeliness, customer satisfaction, cost control and business practices that the Offeror has demonstrated on projects of a similar scope and nature in the past.

- **Cost/Price**: The cost/price proposal will be evaluated for magnitude and realism. Price factors will also be used as a further indication of the Offeror's understanding of the scope of the requirement. Total Life Cycle Costs to the Government, both direct and indirect, will be evaluated.

- **Facilities**: The facilities proposed to house the HPCS will receive a narrative description. A site visit by the Government to all offered nongovernment-owned facilities will be required as part of, or in addition to, the Live Test Demonstration.

M.2.1 Basis for Award

The contract awarded as a result of this Request for Proposals (RFP) will be an integrated assessment by the Contracting Officer of the results of the evaluation based on the evaluation factors and their relative order of importance as indicated below.

Ultimately, the source selection decision will take into account the Contractor's capability to meet the requirements of this solicitation on a timely and cost-effective basis. The Government reserves such right of flexibility in making the source selection to assure placement of a contract in the Government's best interest in accordance with the evaluation criteria.

Accordingly, the Government may award any resulting contract to other than the lowest-priced Offeror, or other than the Offeror with the highest technical merit.

M.2.2 Degree of Relative Importance Assigned to Major Evaluation Factors and Subfactors

The Technical factor will be weighted significantly more than Past Performance. The combination of the Technical factor and Past Performance will be paramount with respect to Price.

M.3 TECHNICAL

The following technical components will be used to evaluate the technical proposals and are all very important to the Government. The Government will conduct its evaluation by developing a list of strengths and weaknesses. They are of roughly equal importance.

- Large-Scale Computing (LSC)
- Storage and Archiving
- System-wide Components

M.3.1 Large-Scale Computing

Factors used to evaluate the LSC are, in order of decreasing importance:

- Performance
- Reliability, Availability, and Support
- User Experience
- Capacity

Items used to evaluate Performance may include, but are not limited to, the System Life Throughput offered on the initial system, the LSC throughput benchmark performance offered on the initial system, the results of the benchmark scaling study, and the performance increment offered on upgrades during the base contract period. Based on information provided by the Contractor, the Government will evaluate proposals in order to verify that workstream performance is appropriate to their funding profile.

Items used to evaluate Reliability, Availability, and Support may include, but are not limited to, the availability level offered in the initial system, the capability of the failover hardware and software, the available features in the resource management, batch queuing and scheduling, load balancing, and checkpointing software, the capability to operate and be repaired in degraded mode and offered training.

Items used to evaluate User Experience may include, but are not limited to, the completeness and usability of the offered OS, programming environment, standard user interfaces, and COTS software, the availability of community supported software, the available features in the resource management, accounting, batch queuing and scheduling, activity monitoring, and checkpointing software and security features.

Items used to evaluate capacity may include, but are not limited to, the memory per processor, the disk space per node, the total memory and disk, the bandwidth of the node interconnect, and the capacity of the interactive resources and the bandwidth to them.

M.3.2 Storage and Archiving

Factors used to evaluate Storage and Archiving are, in order of decreasing importance:

- Performance
- Reliability, Availability, and Support
- Capacity
- Communications with the Operational Central Computing System (OCCS) and its Backup System
- User Experience

Items used to evaluate Performance include, but are not limited to, the archive benchmark performance, aggregate sustained transfer rate of individual devices, file positioning rate, aggregate tape positioning rate for nearline tapes, the robotic tape library performance and the performance of the user and operator interfaces to the data migration software.

Items used to evaluate Reliability, Availability, and Support may include, but are not limited to, the capability of the failover software, capabilities for operation and repair and degraded mode, backup capabilities, the ability to operate in the absence of the LSC, the reliability of the robotic tape library, the reliability of the nearline and offline media, and the offered data recovery service.

Items used to evaluate capacity of the Hierarchical Storage Management System (HSMS) include, but are not limited to, the capacity of the nearline and offline tiers in the data archive, the number of individual devices, residency time on disk cache, total bandwidth between nearline and online tiers in the HSMS, its expansion capability and data transfer rates.

Items used to evaluate capacity of other storage components including the Fast Scratch file system may include, but are not limited to, the capability of fault-tolerance, data storage capacity, the number of individual devices, how often data needs to be removed from staging areas, total bandwidth, its expansion capability and data transfer rates.

Items used to evaluate the communications with the Operational Central Computing System (OCCS) include, but are not limited to, the ability to write data generated from the OCCS to the R&D HSMS that supports workstreams 4-9, the ability of the Backup System to read from and write to the R&D HSMS that supports workstreams 4-6, and any communications link necessary to support Workstream 4-6 and the Primary and Backup OCCS dataflows to and from the HSMS. Note that the Primary and Backup OCCS HSMS data interfaces may be implemented at *either* Fairmont, WV or Gaithersburg, MD since operational data are mirrored at both sites.

Items used to evaluate the User Experience include, but are not limited to, the functionality and usability of the user and operator interfaces to the data migration software, including the ability to send files from tape directly to different destinations over the network and for users to group related files and directories on a single tape volume, the ability of the HSMS software to provide automatic migration between data

archive tiers, and the plan for accessing the legacy archive as well as the backup and recovery features for system data files.

M.3.3 System-wide Components

Factors used to evaluate the system-wide components are, in order of decreasing importance:

- Balanced performance and capacity between the HPCS subsystems
- Security
- Support Services
- Adaptability and Flexibility

As discussed in Section C.1, balance implies that the capacity and performance of the LSC, HSMS, Home File System (HFS) and their interconnection allows efficient use of the HPCS resources, in part by minimizing bottlenecks to the flow of information (as represented by the benchmarks) between the components of the HPCS throughout its life. The subfactors used to evaluate balance may include, but are not limited to, the individual capacities of the HPCS components, the bandwidth between HPCS components and to model and observational data, the reliability of the network providing model and observational data, and the cluster software used to manage the various resources of the HPCS.

Items used to evaluate the security of the system include, but are not limited to, the durability and integrity of security access components (hardware and software devices), providing a secure remote access, logging of user access, and adherence to all applicable government IT security regulations and procedures.

Items used to evaluate Support Services may include, but are not limited to, the plan offered to move toward the “One NOAA” vision, the quality of the Offeror’s maintenance plan, management plan, transition plan (including the costs, if any, of loss of performance during the transition), change management plan, failure escalation procedure, capable personnel staffing, training and documentation and user assistance.

Items used to evaluate Adaptability and Flexibility include, but are not limited to, the ease of code portability and maintenance, minimal performance loss by running on other than the target LSC architecture, easy and reliable access to data for any user and minimal variability in user environments.

M.4 PAST PERFORMANCE

This factor will be rated based on the information and opinions gained by contacting the references listed in the proposal, firms with which the Offeror has a history of past performance, and possibly other customers known to the Government and others who may have useful and relevant information. The Government reserves the right not to contact all references provided and to contact other references even though not provided by the Offeror.

The following subfactors will be considered (all subfactors are of equal importance):

- Quality of products or service, compliance with contract requirements, accuracy of reports and technical excellence.
- Timeliness of performance and reliability.
- Cost control, remaining within budget, current accurate and complete billing, relationship of negotiated costs to actuals and being cost effective.
- Satisfaction of customer end users with the contractor's service.
- Business relations, management, and effective subcontracting program, reasonable and effective contractor-recommended solutions.

Assessment of the Offeror's past performance will be one means of evaluating the credibility of the Offeror's proposal, and relative capability to meet performance requirements.

Information will also be considered regarding and significant subcontractors.

Evaluation of past performance will include a determination of the Offeror's commitment to customer satisfaction and will include conclusions of informed judgment. The basis for the past performance rating will be documented.

During discussions Offeror's will be given an opportunity to address unfavorable reports of past performance, if the Offeror has not had a previous opportunity to review the rating. Recent contracts will be examined to ensure that corrective measures have been implemented. Prompt corrective action in isolated instances may not outweigh overall negative trends.

If an Offeror does not have a past performance history relating to this solicitation, the Offeror will not be evaluated favorably or unfavorably on this factor.

M.5 COST/PRICE

The cost/price proposal will be evaluated for magnitude and realism, but will not be numerically scored. To be considered acceptable under this solicitation, the Offeror must propose fixed prices for the items to be acquired.

M.6 FACILITIES

The Facility Proposal will be evaluated on a pass/fail basis on the site's ability to provide a detailed plan on the site's usage, a viable Information Technology infrastructure with respect to meeting all Government requirements in addition to: 24/7 access for government personnel, raise floor, amount of electrical power, cooling capacity, physical security, backup power, backup cooling, fire suppression system, the floor space required to operate the initial delivery of the HPCS and the ability to support upgrades and expansion.

A site visit by the Government may be required as part of, or in addition to, the Live Test Demonstration for inspection purposes. No inspection of the Facility will be required if the Offeror proposes to use all GFE.

In the event an unfavorable evaluation is received (a failing grade) on the Facility Proposal, the entire proposal is judged unacceptable.

M.7 EVALUATION FACTORS

All technical and Past Performance portions of proposals will be evaluated using the criteria listed in Table 1 below. Each Offeror will be assigned a Summary Rating for its Technical and Past Performance, determined through evaluation of its proposal.

Table 1. Evaluation Criteria

ADJECTIVE RATING	DESCRIPTION
Unacceptable	PROPOSED APPROACH HAS MANY DEFICIENCIES OR PROPOSED APPROACH IS TOTALLY WITHOUT MERIT. PAST PERFORMANCE UNACCEPTABLE.
Inadequate	PROPOSED APPROACH HAS ONE OR MORE DEFICIENCIES OR MAJOR WEAKNESSES, AND IS NOT CAPABLE OF IMPROVEMENT TO ACCEPTABLE OR BETTER WITHOUT ADOPTION OF A NEW APPROACH. PAST PERFORMANCE MORE NEGATIVE THAN ACCEPTABLE.
Marginal	PROPOSED APPROACH HAS DEFICIENCIES OR SIGNIFICANT WEAKNESSES, BUT IS CAPABLE OF IMPROVEMENT TO ACCEPTABLE OR BETTER WITHOUT ADOPTION OF NEW APPROACH. NO OR NEUTRAL PAST PERFORMANCE.
Acceptable	PROPOSED APPROACH FULLY MEETS THE REQUIREMENT WITH NO DEFICIENCY OR SIGNIFICANT WEAKNESS. PAST PERFORMANCE MORE POSITIVE THAN NEGATIVE.

Good	PROPOSED APPROACH FULLY MEETS REQUIREMENT AND HAS SOME SUPERIOR FEATURES WITH NO DEFICIENCY OR SIGNIFICANT WEAKNESS. PAST PERFORMANCE ACCEPTABLE IN ALL AREAS/SUPERIOR IN SEVERAL AREAS.
Outstanding	PROPOSED APPROACH FULLY MEETS REQUIREMENT AND IS SUPERIOR IN MANY FEATURES WITH NO DEFICIENCY OR WEAKNESS. PAST PERFORMANCE ACCEPTABLE IN ALL AREAS/SUPERIOR IN MOST AREAS.